

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
16 May 2002 (16.05.2002)

PCT

(10) International Publication Number  
WO 02/38016 A1(51) International Patent Classification<sup>7</sup>: A47J 31/40, 31/06

(21) International Application Number: PCT/IB01/02095

(22) International Filing Date:  
7 November 2001 (07.11.2001)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:  
BO2000A000643 7 November 2000 (07.11.2000) IT  
BO2000A000644 7 November 2000 (07.11.2000) IT  
MO2001A000100 18 May 2001 (18.05.2001) IT

(71) Applicant (for all designated States except US): SMILE COFFEE S.R.L. [IT/IT]; Viale Tripoli, 73, I-47900 Rimini (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): CHIUSOLI, Fabio [IT/IT]; Via Agucchi, 151, I-40131 Bologna (IT). BAFIONI, Domenico [IT/IT]; Via Ungaretti, 8, I-61020 Mercatale (IT). CERA, Ruggero [IT/IT]; Via Marco Celio, 16/A, I-40132 Bologna (IT).

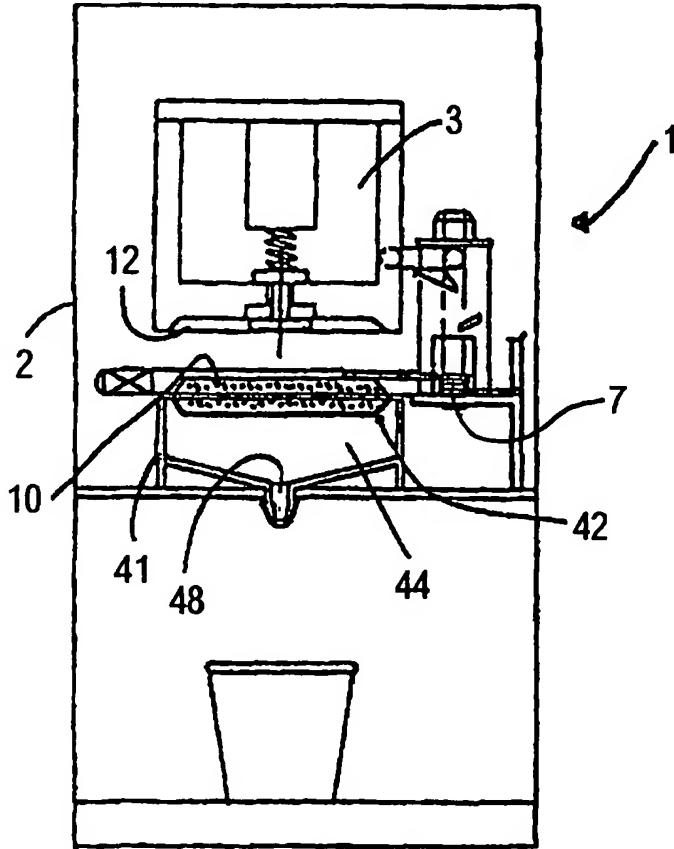
(74) Agent: LUPPI, Luigi; Luppi &amp; Crugnola S.r.l., Viale Corassori, 54, I-41100 Modena (IT).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: APPARATUS FOR DISTRIBUTING BEVERAGES





patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH,*

*CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designation US*
- *of inventorship (Rule 4.17(iv)) for US only*

**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

Apparatus for distributing beverages

The present invention relates to an apparatus for distributing beverages, particularly hot beverages and/or infusions, such as coffee, cappuccino, tea, etc.

5 More in particular, the present invention relates to an apparatus, employing containers, for distributing espresso coffee capable of automatically carrying out the expulsion and the unloading of the containers after that the desired beverage has been distributed.

10 The present invention further relates to a distributing nozzle for distributing machines of beverages.

Machines are known for distributing hot beverages and/or infusions, such as espresso coffees, consisting essentially of a casing containing, at its interior, from the top towards the 15 bottom, a heat exchanging system, for heating the water and for leading said water towards a seat designed for receiving the coffee container.

The lower support of the container seat further provides a filter leading into a beverage collecting chamber provided 20 with an outlet hole for distributing the said beverage.

In the machines currently in use for distributing espresso coffees, different defects may be found, such as the difficulty in correctly inserting and positioning the container into the appropriate seat, but mainly the need of 25 having to manually provide, by care of the user, at the end of each distribution of the coffee, for extracting and unloading the used container.

Quite often, in fact, it may happen that the user forgets proceeding to extract the container that, when left for too 30 much time inside the relative seat, may attach to the walls of the said seat and make difficult, for the next user, to proceed with the relative extraction.

Furthermore, before taking the coffee, it is necessary to extract from the machine the used container, that results a waste of time for the user.

The known machines are generally provided with a recess inside 5 which a cup is laid on a support plane, the cup having a specific size comprised in a certain range of usable sizes, and showing its upper border placed at the outlet opening of the beverage.

In the most cases, a plurality of outlet openings are 10 provided, according to the nature and the typology of the beverages to be distributed, substantially positioned at the same level.

The typology and the nature of the beverages distributed by the machine not only define the number and the structural 15 properties of the outlet openings of such beverages, but also the size of the cups to be faced to the said outlet openings during the distribution phase.

In fact, it is necessary to provide cups with a greater size for beverages containing a greater amount of diluting liquid, 20 such as barley, tea and American coffee, whereas it is convenient to provide cups of smaller size for the espresso coffee and, possibly, the cappuccino.

That implies consequently that the distance between the distributing opening and the cup is greater for the cups 25 having a smaller volume, and is smaller for the cups having greater volume, being the second ones higher than the first ones.

In designing the machine, it is necessary that the distance between the outlet openings of the distributed beverages and 30 the support plane is chosen so as to enable the positioning of cups with greater size.

From here it results that, when a beverage requiring a cup of relatively great height is distributed, the distance between the corresponding outlet opening of the beverage and the inlet

section of the cup results relatively small, with a proper and optimal dropping of the beverage towards the cup at the distributing phase, substantially free from projections of splashes and spurts of the beverages beyond the cup in 5 question.

In the case, on the contrary, the distribution was needed of a beverage requiring a cup of height relatively small, the distance between the outlet opening of the beverage and the inlet section of the cup would be relatively high, with high 10 probability that splashes and spurts of the beverage are projected beyond the chosen cup.

The implies a waste of beverage and a great soiling of the recess for housing the cups, that requires maintenance and cleaning interventions particularly frequent. Furthermore 15 machines are known for preparing espresso coffee provided with loaders comprising a drawer hinged to a basic body and suitable for receiving a container of powdery coffee.

The drawer is provided with a cup shaped container at the upper end of which support means is arranged suitable for 20 receiving the container and to support said container during the passage of the water through said container. The container is further provided with a compartment arranged for receiving the espresso coffee so prepared and, at its lower end, with an unloading opening suitable for transferring the said espresso 25 coffee into an underlying cup in order to make the said espresso coffee available to an end user.

Such drawer is moving around a vertical pin, that fixes the said drawer to the said base body, between a loading position wherein the container is arranged externally with respect to 30 the base body in order to enable the end user to remove an already used container and/or to insert a new container and a working operating position wherein the container is inserted inside the base body so as to bring the container up to distributing means of hot water.

With the above mentioned drawer a known blocking device is associated that, after a pressure on said blocking device has been exerted by the end user, enables the drawer to be held in its operating position during the preparation of the espresso coffee, and subsequently, after a further pressure has been exerted on said blocking device by the end user, enables the drawer to be extracted in order to be transferred to its loading position.

The machine further comprises an electric switch, activated by the drawer when the said drawer lies in operating position, that functions as a safety device and is appointed to enable the injection of hot water through the container by the distributing means.

A defect of the machines of this type consists in a remarkable difficulty for cleaning: in particular the drawer, i.e. the machine portion becoming more easily dirty, results hardly suitable for being cleaned, since it is fixed to the base body in permanent manner.

Such drawer, in fact, may be separated from the base body only by providing to dismount it from the machine, such operation resulting uncomfortable and not achievable by users that are not provided with suitable tools for carrying out the dismounting operations.

A further defect of the known machines consists in a certain mounting difficulty since the blocking devices and the electric switches must be assembled on the base body so as to prevent mutual positioning errors that would preclude the possibility of a proper working of the said machine.

A still further defect of the machines of the prior art consists in their low versatility: the drawer with which the said machines are provided, in fact, is arranged to receive only containers having a prefixed diameter, corresponding to a pre-established amount of coffee powder, that prevents the amount of espresso coffee to be prepared from being selected.

A purpose of the present invention is to improve the machines, using containers, for distributing hot beverages and/or infusions.

Another purpose of the present invention is to propose a 5 machine for distributing espresso coffee capable of expelling and unloading the used containers.

It is as well a purpose of the present invention to propose a machine, using containers, for distributing hot beverages and/or infusions, in particular coffee, capable of executing 10 the automatic unloading of the used containers by means of a technical solution of simple ideation and extremely functional and reliable.

Another purpose of the invention is to make more regular the flow of beverages in a manner substantially independent from 15 the size of the cup.

Another purpose is to obtain a machine for preparing espresso coffee provided with a container loader suitable for being easily cleaned.

A still further purpose is to obtain a machine for preparing 20 coffee that may be assembled in easy manner.

A still further purpose of the invention is to obtain a machine for preparing espresso coffee that is particularly versatile, being able to be easily fed with containers of different size and therefore containing different amounts of 25 coffee.

In a first aspect of the invention, an apparatus is provided, for distributing hot beverages and/or infusions, in particular coffee, comprising a casing, a heat exchanger, a drawer provided with a container holding filter support, 30 communicating with a collecting chamber of said beverages and/or infusions, externally leading by means of a distribution opening, characterised in that it further comprises expelling arm means arranged for expelling said

container from said filter support after that said container has been used..

Owing to this aspect of the invention, it is further possible to obtain an apparatus for distributing espresso coffee that 5 enables an easy and immediate insertion of the container into the proper seat.

In a second aspect of the invention an apparatus is provided for preparing beverages, comprising receiving means suitable for receiving container means containing a base substance of 10 the beverage to be prepared characterised in that with said receiving means extracting means is associated arranged for transferring said container means from a lowered position wherein said container means is in contact with said receiving means to a raised position wherein said container means is 15 placed at distance from said receiving means.

Owing to this aspect of the invention it is possible to prevent an undesired adhesion of the container means to the receiving means, such adhesion substantially preventing expelling arm means associated with the receiving means from 20 expelling the container means from the receiving means, once the beverage has been prepared.

In a preferred version the extracting means comprises pushing means arranged for transferring the container means from the lowered position to the raised position. In another 25 advantageous position, the extracting means comprises elastic thread means.

In another preferred version, the extracting means comprises filter support means arranged for supporting and transferring the container means.

30 In a third aspect of the invention, a distributing nozzle is provided for beverages distributing apparatuses, said distributing apparatuses comprising at least a housing seat for containers having height comprised in a certain range of heights, said seat identifying downwardly a support plane for

such containers and upwardly at least a distributing opening for said beverages, characterised in that it comprises nozzle means placed at the distributing opening of the beverage.

Preferably, the nozzle means comprises a main nozzle, and at 5 least an additional nozzle stiffly associated with said main nozzle, said main nozzle and said at least an additional nozzle being oscillating so that the additional nozzle may adopt a position such as to enable the beverage to flow out through said additional nozzle only when the main nozzle is 10 moved from an its own distributing position.

Preferably, the additional nozzle is mounted in oscillating manner around an axis substantially parallel to said support plane.

Owing to this aspect of the invention it is possible to obtain 15 a distributing nozzle for distributing apparatuses of beverages capable of assuring a correct and optimal distribution of the said beverages, during such distribution no projection of splashes and/or spurts of the said beverages taking substantially place beyond the containers of variable 20 size suitable for containing the said beverages, by maintaining substantially constant the distance between the inlet section of the containers and the relative outlet opening of the beverages.

Furthermore, it is possible to achieve a distributing nozzle 25 particularly reliable and very practical in any functioning condition of the distributing apparatus, capable of assuring a pre-established percentage amount of substances distributed into the relative containers of variable size.

To this the possibility is added of obtaining a distributing 30 nozzle of particularly low cost, of interchangeable type, that enables to carry on an easy maintenance and/or cleaning of the said distributing nozzle.

In a fourth aspect of the invention, an apparatus is provided for preparing beverages, comprising receiving means suitable

for receiving container means containing a base substance of the beverage to be prepared and moving between a loading position wherein said receiving means is arranged externally to a base body of said apparatus in order to receive said 5 container means and an operating position wherein said receiving means is arranged internally to said base body in order to bring said container means to interact with distributing means of hot water, characterised in that said receiving means is fixed in removable manner to said base 10 body.

In an advantageous version, said receiving means is associated with said base body by means of hinge means arranged so that an operating portion of said hinge means, firmly connected with said receiving means, may be easily disconnected from 15 another operating portion of the hinge means firmly fixed to said base body.

In a preferred version, the operating portion comprises pin means and the other operating portion comprises seat means co-operating with said pin means.

20 To have provided that the seat means is obtained in the base body enables an easy removal of the receiving means in order to clean the said receiving means.

In another advantageous version, the receiving means is sliding on guide means associated with the base body and 25 results therefore easily removable from the respective apparatuses and may be subjected to suitable cleaning operations.

Owing to this aspect of the invention, it is possible to obtain an apparatus for producing espresso coffee particularly 30 hygienic since suitable for being easily subjected to operations of cleaning and maintenance.

In a fifth aspect of the invention, an apparatus is provided for preparing beverages, comprising receiving means provided with cup means suitable for receiving container means of a

base substance of the beverage to be prepared, characterised in that said cup means is suitable for being extracted from said receiving means.

In an advantageous version the cup means comprises filter holding elements of different dimensions that result, therefore, suitable for receiving containers consisting of different amounts of powder, for example of coffee, and thus having different diameters.

Owing to this aspect of the invention, it is possible to obtain a coffee machine suitable for producing pre-established amount of espresso coffee without varying the ratio between water and coffee powder.

In a sixth aspect of the invention, an apparatus is provided for preparing beverages, comprising receiving means suitable for receiving container means containing a base substance of a beverage to be prepared and electric switch means suitable for enabling said apparatus to be activated, characterised in that to said receiving means deformable push-button means is firmly fixed suitable for interacting with said electric switch means in order to control said electric switch means.

Owing to this aspect of the invention, it is possible to obtain a machine for preparing espresso coffee provided with push-button means that enables to compensate possible clearance or positioning errors, present between the receiving means and a base body of the said machine.

In particular, the push-button means, arranged in order to control the switch means, being suitable for being produced with elastically deformable elements, enables the clearance to be compensated, that enables the machine to be activated also in the case that the assembly was executed in rough manner.

In an advantageous version, the apparatus further comprises pressure blocking means suitable for holding the receiving means fixed to the base body of the apparatus in an operating position.

It is noticed that the switch means and the pressure blocking means are preferably both actuated by distinct portions of the receiving means and therefore must be mutually positioned in a suitable manner. In order to perform such mutual positioning in a simple way, a common support is provided on which both the switch means and the pressure blocking means may be mounted while said switch means and said pressure blocking means lie beyond the machine so as to be able then to be positioned in pre-established position into the said machine.

5 The invention may be more easily understood with reference to the following description of some versions of the apparatus, illustrated for exemplifying purpose in the attached drawing tables wherein:

10 Figure 1 is a sketched section taken along a longitudinal vertical plane of a machine according to the present invention;

15 Figures 2a and 2b are transversal, sketched, partial sections, respectively side section and top section, of the machine of Figure 1 at an operating configuration of the machine when a 20 container is introduced;

Figures from 3a to 3e show, in sketched manner and according to partial, longitudinal, vertical sections, a sequence of operating positions of the machine during the preparation of the coffee and the expulsion and unloading of an exhausted 25 container;

Figure 4 is a sketched top view of the ejecting arm means of an exhausted container highlighting by a continuous line the arm at an intermediate ejecting step of the container, and by dotted line the arm at a starting and ending step;

30 Figure 5 is a top view, partially sectioned, of a version of the ejecting arm means and respective actuating means;

Figure 6 is a sketched front view of another version of the ejecting arm means actuated by a lever mechanism;

Figure 7 is a section VII-VII of Figure 6;

Figure 8 is a vertical, longitudinal section of a distributing machine provided with a nozzle according to the invention at a distributing step inside a relatively low container;

5 Figure 9 is an enlarged detail of the distributing nozzle represented in Figure 8;

Figure 10 is a longitudinal section like Figure 8, highlighting the positioning of the distributing nozzle when the beverage is poured into a relatively high container;

10 Figure 11 is an enlarged detail of the distributing nozzle represented in Figure 10;

Figure 12 is a top view of a machine for preparing beverages according to the invention;

15 Figure 13 is a side view of the receiving means of the machine of Figure 12 highlighting height positioning means of hinge pin means arranged for connecting the receiving means with a base body of the machine;

Figure 14 is a side view of the receiving means of Figure 12 during a removing step of the receiving means from the base body of the machine;

20 Figure 15 is a side view of the receiving means of Figure 12 at a subsequent, removing step of the receiving means from the base body of the machine;

Figure 16 is a top view of a variance of a machine for preparing beverages according to the invention;

25 Figure 17 is a top view of the receiving means of the machine of Figure 16;

Figure 18 is a side view of the base body of the machine of Figure 16;

Figure 19 is a side view of the receiving means of Figure 17;

30 Figure 20 is a front view of the base body of Figure 16;

Figure 21 is a front view of cup means of a machine according to the invention suitable for receiving a container, for example containing powder of coffee, of great diameter;

Figure 22 is a front view of cup means of a machine according to the invention suitable for receiving a container of small diameter;

Figure 23 is a top, partially exploded view of connecting means arranged for connecting the receiving means of the apparatus of Figure 12 with the base body of the same machine;

Figure 24 is a section taken along a vertical plane of a preferred version of extracting means according to the invention;

10 Figure 25 is a top view of the extracting means of Figure 24; Figure 26 is a section taken along a vertical plane of another preferred version of extracting means according to the invention;

Figure 27 is a top view of the extracting means of Figure 26;

15 Figure 28 is a section taken along a vertical plane of a further preferred version of extracting means according to the invention;

Figure 29 is a top view of the extracting means of Figure 28;

20 Figure 30 is a section taken along a vertical plane of a still further preferred version of extracting means according to the invention, representing the extracting means at a raised position;

Figure 31 is a section like Figure 30 highlighting the extracting means at a lowered position.

25 With reference to the Figures 1 to 7, a machine 1 is shown, employing containers, for distributing hot beverages and/or infusions, in particular coffee.

The machine 1 comprises a casing 2, at whose interior there are provided a heat exchanger 3, a drawer 41 provided with a 30 filter support 42 for housing a container 10.

The container 10 consists of two sheets of flexible material, for example paper or tissue, peripherally joined so as to encapsulate the substance with which the infusion is obtained.

The filter support 42 is communicating, downwards, with a collecting chamber 44 that communicates with the exterior by means of an outlet opening 48 for distributing the coffee.

5 The heat exchanger 3 is vertically movable, for example by means of a reciprocating piston system not shown, between a lower operating position S1 (Figure 3c) and an upper not-operating position S2 (Figure 3a).

10 The lower operating position S1 corresponds to positioning a lower face 12 of the heat exchanger 3 in contact with the upper portion of a container 10 arranged on the filter support 42. In this operating configuration S1 the water warmed by the heat exchanger 3 may flow from valve means 21 toward the container 10 by crossing the container 10 and expanding itself through said container 10 in order to give place to the coffee 15 beverage. At the upper not-operating position S2, instead, the heat exchanger 3 is at a remote position with respect to the filter support 42 so as to enable that an exhausted container 10 may be unloaded.

20 The heat exchanger 3 is provided with an external control member 18, consisting of a protrusion having an end fixed with said heat exchanger 3 and further free end shaped so as to intercept main cam means 20 and secondary cam means 30, 31 provided on the external surface of redirecting means 16 placed side by side to the heat exchanger 3 and rotating 25 around a vertical axis 15.

The redirecting means 16 consists of a bushing aligned on said vertical axis 15, expelling arm means 14 of the exhausted container 10 results downwardly restrained.

30 The expelling arm means 14, having an arcuated structure, results therefore rotating around said vertical axis 15 between a rest position P1 (visible in Figure 4), wherein said expelling arm means 14 is positioned near the filter support 42 and does not interact with the container 10 and an operating position P2 (visible in Figure 4) wherein said

expelling arm means 14 interacts with the exhausted container 10 in order to move the exhaust container 10 from the filter support 42 towards a collector (not shown).

The expelling arm means 14 passes from the rest position P1 to 5 the operating position P2, as more in detail it will be described in the following, by following according to a direction W (Figure 3d) a rotation of the redirecting means 16 around the axis 15.

The expelling arm means 14 rotates around an opposed direction 10 in order to return in the rest position P1 under the bias action of elastic means 7 associated with the same expelling arm means 14.

The elastic means 7 comprises a spring, for example of the spiral type, or coil type, having a first end fixed to a 15 portion of frame firmly connected with the casing 2 and a second end acting on the expelling arm means 14.

The machine 1 is further provided with a groove 40 affected by guides 23 provided below the drawer 41.

In this manner, the drawer 41 may be moved between a first, 20 external end stroke stop 5, at which the drawer lies at a certain distance from the heat exchanger 3 in order to enables a new container 10 to be introduced into the filter 42, and a second, internal end stroke stop 4 at which the filter support 42 positions the container 10 at the heat exchanger 3.

25 A micro-switch 50 is associated with the second end stroke stop 4 designed for activating the distribution of the coffee as a result of the proper positioning of the filter support 42, when the container 10 is positioned below the heat exchanger 3.

30 In the following, the operation is described of the machine 1 subject of the present invention, by considering as starting configuration that shown in Figure 3a, corresponding to the positioning of the heat exchanger 3 in the relative, upper not operating position S2 and to the positioning of the expelling

arm means 14 in the rest position P1, near the filter support 42.

The user getting ready to prepare a coffee, extracts the drawer 41, by causing to slide the relative guides 23 on the 5 groove 40 until the first external end stroke stop 5, and inserts a container 10 into the filter support E.

Once the container has been inserted, the user, by causing the drawer 41 to slide, repositions the same drawer at the second internal end stroke stop 4 by activating the micro-switch 50.

10 The micro-switch 50 activates then the heat exchanger 3 that is moved from the upper, not-operating position S2 to the lower operating position S1 for distributing the coffee (Figures 3a to 3c).

During lowering of the heat exchanger from the not operating 15 position S2 to the operating position S1, the control member 18 intercepts the secondary cam means 30, 31 by activating a first slight rotation Z and a second slight rotation Z', opposed to the first rotation Z, of the idle redirecting means 16 around the axis 15: that produces a slight swing of the 20 expelling arm means 14, near the relative rest position P1 (Figure 4).

The presence of the secondary cam means 30, 31 is determined by merely constructive requirements and by the need of arranging the control member 18 at the positioning of the heat 25 exchanger 3 in the lower position S1 relative to the distribution of the coffee (Figure 3c), just below the main cam means 20.

At the end of the coffee distribution, the machine 1 raises the heat exchanger 3 towards the upper, not-operating position 30 S2 (Figure 3d).

During the transition of the heat exchanger 3 from the lower, operating position S1 to the upper, not-operating position S2, the control member 18 intercepts the main cam means 20 (Figure 3d and Figure 3e), by determining the rotation of the

redirecting means 16 along the direction W, around the vertical axis 15.

Such rotation W of the redirecting means 16 causes the expelling arm means 14 to be actuated and moved from the rest position P1 up to intercept the container 10 inside the filter support (Figure 3d), to extract the same container 10 from the filter support E, and at reaching the operating position P2, to unload the same container 10 into a collecting seat (Figure 3e and Figure 4).

10 Simultaneously with the positioning of the expelling arm means 14 in the operating position P2, the heat exchanger 3 returns in the relative, upper, not-operating position S2 (Figure 3a) and the control member 18 leaves the main cam means 20 by making again idle the redirecting means 16.

15 In such manner, the elastic members 7, loaded by the displacement of the expelling arm means 14 from the position P1 to the position P2 may then recall the expelling arm means 14 in the rest position P1.

20 Repositioning and recalling the expelling arm means 14 determines a rotation, around the axis 15, of the idle redirecting means 16 opposed to the above mentioned direction W, which rotation enables to position the mentioned secondary cam means 30 at the control member 18 (Figure 3a).

25 With the above described operations the machine 1 automatically performs, and without the external involvement of a user, the unloading of the used container.

It results therefore extremely apparent that the above described machine 1 is capable of advantageously performing, in automatic manner and without any external intervention, the 30 unloading of the used container.

It is to be highlighted that, the operating steps for achieving the extraction of the container from the filter support 42 and unloading the same container into a collecting

seat are made by means of an extremely simple and practical technical solution.

It is to be added that the proposed machine allows, advantageously, to completely extract, in a simple and 5 practical manner, the drawer 41 and the filter support 42, by facilitating the insertion of a new container.

With reference to Figure 5, actuating means 60 is shown comprising for example an electromagnetic actuator 61 provided with a stem 62 suitable for rotating the expelling arm means 10 14 in order to transfer said expelling arm means 14 from the rest position P1 to the operating position P2, and vice versa. The expelling arm means operates in such case as a lever and is provided with an appendage 63 connected to the stem 62 by means of a hinge 64, placed in a position indicated by R: in 15 such manner the expelling arm means 14 results swinging around a point F constituting the fulcrum of the above mentioned lever.

Alternatively, in the case that is required by particular constructive requirements, the hinge 64 may be placed at a 20 position S wherein the said hinge 64 results interposed between the fulcrum F and the region 65 of the expelling arm means 14 that comes into contact with the container 10.

In a not-shown variance, between the actuating means 60 and the expelling arm means 14 a further lever may be provided 25 arranged for redirecting the movement and for enabling the actuating means to control the expelling arm means 14 even in those particular embodiments of the machine 1 wherein, for constructive reasons, for example connected to the encumbrances, the actuating means can not be positioned near 30 the actuating arm.

Advantageously, the electromagnetic actuator 61 may be of the double-acting type, i.e. provided with a pair of coils that control, alternatively, the transferring of the expelling arm means 14 from the position P1 to the position P2.

Advantageously, such electromagnetic actuator may be activated by proper sensor means suitable for detecting a pre-established raising of the heat exchanger 3 during its movement towards the upper, not-operating position S2.

5 Alternatively, the electromagnetic actuator 61 may be of the simple-action type, in such case the electromagnetic actuator 61 comprises a spring arranged for bringing back the expelling arm means 14 from the operating position P2 to the rest position P1, or vice versa.

10 In an advantageous version, not shown, the actuating means 60 comprises a pneumatic actuator.

In another advantageous version, not shown, the actuating means 60 comprises an hydraulic actuator actuated by the same pump controlling the above mentioned reciprocating piston system that transfers the heat exchanger 3 from the lower, operating position S1 to the upper, not-operating position S2 (Figure 3a), and vice versa.

Alternatively, for actuating the hydraulic actuator may be provided a further pump arranged for supplying the hydraulic actuator.

With reference to the Figures 6 and 7, a variance is shown of the machine 1 according to the invention, wherein the expelling arm means 14 is controlled by a first lever 66 co-operating with a second lever 67.

25 The first lever 66 is swinging around the respective fulcrum F2 and is provided at an end 68 with a bracket 69 arranged for surrounding a shank 70 obtained in the expelling arm means 14. The first lever 66 further comprises, at a further end 71 opposed to the end 68, a region 72 arranged for interacting with the second lever 67.

The second lever 67 is swinging around its respective fulcrum F3 and is provided, at an end 73, with a bracket 74 arranged for surrounding the region 72 of the first lever 66. The

second lever 67 further comprises, at a further end 75 opposing the end 73, a support 75.

The expelling arm means 14 is coupled by rotation with the frame of the machine 1 so as to result swinging around a 5 fulcrum F1 resulting interposed between the shank 70 and the region 65 of the expelling arm means 14 coming into contact with the container 10.

The support 75 is shaped so as to result suitable for coupling with the external control member 18 firmly connected to the 10 heat exchanger 3 so that this later directly controls the ejection of the container 10.

Alternatively, the support 75 may be coupled with the stem 62 of the actuating means 61 and, therefore, ejecting the container 10 may be made independent from the movement of the 15 exchanger 3.

Alternatively, instead the further lever, or the further plurality of levers, a cable control device may be provided arranged for connecting the actuating means and the expelling arm means 14.

20 Ejecting a used container results according to the manners in the following described.

The actuating means 61, or the external control member 18, interacts with the support 75 by causing its translation in the direction indicated by the arrow L, that causes the 25 rotation of the second lever 67, around the respective fulcrum F3, into the direction of the arrow N.

The second lever 67 activate the first lever 66 to rotate, around the respective fulcrum F2, in the direction of the arrow O. As a consequence, the expelling arm means 14 rotates 30 around the fulcrum F1 along the direction of the arrow Q bringing the region 65 of the expelling arm means 14 to interact with the container 10 in order to eject the same container 10 from the filter support 42.

With reference to the Figures 24 to 31, extracting means 300 is shown arranged for raising an exhausted container 10 from the filter support means 42 in order to allow the said container 10 to be ejected by the expelling arm means 14.

5 The employment of the extracting means 300 enables an easy ejection of the container 10 since the said employment of the extracting means 300 prevents the aptitude of the said container 10 for gluing itself to the filter support means 42. As shown in the Figures 24 and 25, the extracting means 300 10 comprises pushing means 301 sliding in the direction of the arrow T inside a seat 303 delimited by a tubular support 302 firmly fixed to the filter support means 42.

The filter support means 42 is provided, at an its central portion, with a hole 304 through which the pushing means 301 15 results passing, in order to interact with the container 10.

Between a central position 301a of the pushing means 301 and the tubular support 302 sealing means 305 is interposed, arranged for preventing the already prepared beverage from penetrating into the interior of the seat 303.

20 The pushing means 301 is fixed, by means of a threaded coupling 306, to a small plate 307 resting on a first end 308 of a spring 309, such spring 309 being provided with a second end 310 resting on inclined walls 311 of funnel filter holding means 312 associated with the drawer 41.

25 As shown in the Figures 26 and 27, the pushing means 301 is sliding inside a further seat 303a obtained into a casing 313 firmly fixed to the filter support means 42.

The pushing means 301 is fixed to a further small plate 307a 30 vertically moving inside a chamber 314, laterally delimited by the casing 313 and downwardly closed by a plate 315.

Inside the chamber 314, a further spring 309a is contained having a further first end associated with the further small plate 307a and a further second end 310a lying resting on the plate 315.

As shown in the Figures 28 and 29, the extracting means 300 comprises elastic means 316 consisting of a first thread 316a and a second thread 316b made, for example of metallic material and shaped so as to constitute a spring suitable for interacting with the container 10 in order to raise the said container 10 with respect to a bottom region 324 of the filter support means 42.

Each of the said first thread 316a and second thread 316b is provided with first end portions 317 placed resting on the inclined walls 311 of the funnel filter holding means 312 and second end portions 318 arranged for interacting with the container 10.

The filter support means 42 is provided, at a central region thereof, with holes through which the first thread 316a and the second thread 316b result passing.

As shown in the Figures 30 and 31, the extracting means 300 comprises filter support means 42a, such filter support means 42a resulting vertically moving inside a hollow 319 identified inside the funnel filter holding means 312.

The funnel filter holding means 312 is further provided with a hollow 323 arranged for receiving the container 10 during the passage of the diluting liquid through the said container 10 for preparing a dose of beverage.

The filter support means 42a comprises an upper wall 320 provided with a plurality of holes arranged for allowing the passage of the prepared beverage and a side wall 321 arranged for interacting with the hollow 319 by leading, in this manner, the translation of the filter support means 42a.

Spring means 322 is interposed between the filter support means 42a and the funnel filter holding means 312, arranged for transferring the filter support means 42a from a lowered position, indicated with A2 in figure 31, wherein the container 10 is resting on a bottom region 323a of the hollow 323, to a raised position, indicated with B2 in Figure 30,

wherein the container 10 is raised from the bottom region 323a and is ready for being removed from the filter support means 42 by the expelling arm means 14.

With reference to the Figures 30 and 31, preparing a dose of 5 beverage results in the manners described in the following.

A user, after having extracted the drawer 41, places a container 10 on the funnel support means 42a. Such container 10 occupies, in this step of the preparing cycle of the beverage, the raised position B2, therefore the said container 10 does not lie in contact with the bottom region 323a of the hollow 323, but is slightly spaced from this later due to the 10 action of the extracting means 300.

Subsequently, the user introduces the drawer 41 into the machine 1.

15 Still subsequently, the heat exchanger 3 is transferred from the upper not operating position S2 to the lower operating position S1 and, therefore, the said heat exchanger 3 brings the container 10 to occupy the lowered position A2, by pushing the said container 10 into the interior of the hollow 323, 20 overcoming the action of the extracting means 300.

Once the distribution of diluting liquid is finished, the exchanger 3 is brought to the upper not operating position S2.

At this point, the extracting means 300 is capable of 25 transferring again the container in the raised position B2 wherein the said container 10 is ready for interacting with the expelling arm means 14.

With reference to the Figures 8 to 11, a machine 1 is shown for distributing beverages, for example hot beverages, provided with a seat 102 for housing containers 105a, 105b, 30 for example cups, respectively with a greater and a smaller vertical size.

Such housing seat 102 identifies downwardly a support plane 103 of such cups 105a, 105b, and upwardly at least an outlet opening 48 of the beverages to be distributed into the said

cups. The distance between the outlet opening and the support plane 103 is defined in a fixed manner, i.e. variable configurations of the said support plane with respect to the said outlet opening are not provided.

5 The distributing nozzle 106, subject of the invention, positioned near the outlet opening 48 provided by the distributing machine 1, comprises essentially a main nozzle 106a, for example laterally hinged with respect to the said outlet opening 48, for conveying into a cup of smaller 10 vertical size beverages flowing out from the same opening 48 faced to said main nozzle 106a, for example espresso coffee or, possibly, cappuccino..

An additional nozzle 106b, stiffly associated with the main nozzle 106a, of smaller longitudinal extension, enables the 15 beverages flowing out from the same outlet opening 48 to be conveyed into a cup 105b of greater vertical size.

In effect, by positioning the cup 105a of vertical smaller size on the support plane 103 of the housing seat 102, it is possible to face the corresponding inlet section of the same 20 cup 105a to the outlet opening 48 of the beverages, communicating in this case with the main nozzle 106a, in substantially vertical configuration, then to proceed with the distributing step (Figure 9).

In the case there was the need of positioning on the support 25 plane 103 a cup 105b of greater vertical size, in order to face the corresponding inlet section to the outlet opening 48 of the beverages, it is necessary to steady intercept the main nozzle 106a with the upper border of the same cup 105b.

Such intercepting produces the rotation along V, around an 30 axis X, of the main nozzle 106a by an angle such to make the outlet opening 48 of the beverages communicating with the additional nozzle 106b, stiffly rotating with the same main nozzle 106a, enabling then the selected beverage to be

distributed, for example American coffee, barley, tea (Figure 11).

The passage from the main nozzle 106a to the additional nozzle 106b is simply obtained by intercepting with the upper border 5 of the cup 105b the same main nozzle 106a that rotates, therefore, along V by an angle suitable for bringing in communication the relative outlet opening 48 with the additional nozzle 106b.

The stabilisation of such configuration is assured by the 10 beating of the upper border of the cup 105b against the main nozzle 106a during the distributing step of the beverages through the additional nozzle 106b.

Once the distributing step was finished, then, by removing the cup 105b from the support plane 103 of the housing seat 102, 15 the main nozzle 106a returns in the vertical configuration that assures the communication of the same main nozzle 106a with the outlet opening 48. In this manner, by using nozzles, main nozzle 106a and additional nozzle 106b, of different longitudinal extensions according to the size of the cups 20 105a, 105b into which it is necessary to distribute the selected beverages, it is possible to maintain substantially constant the distances between the relative inlet sections of the cups 105a, 105b and the corresponding outlet opening 48 of the beverages.

25 In effect, a main nozzle 106a of greater longitudinal extension is associated with cups 105a of smaller vertical size, and vice versa an additional nozzle 106b of smaller longitudinal extension is associated with cups 105b of greater vertical size.

30 By doing so, it is possible to assure in optimal manner a proper distributing step of the beverages into the relative cups 105a, 105b without producing any projecting type of splashes and/or spurts of the same beverages outside the same cups 105a, 105b.

That allows to reduce in particular the interventions of maintenance both on the distributing machine and on the distributing nozzle, by preventing at the same time to much frequent cleaning interventions of the housing seat 102.

5 In this manner, it is further advantageously assured the constancy of the amount of beverage that is distributed into the corresponding cup 105a, 105b.

The distributing nozzle 106, subject of the invention may be achieved with the relative nozzles, main nozzle 106a and 10 additional nozzle 106b, of interchangeable type, so as to allow, in irrelevant manner, by choice, the substitution of one or the other.

15 It is possible on the other hand to provide a plurality of additional nozzle 106b associated with the main nozzle 106a, mutually stiffly associates, with decreasing longitudinal extensions.

20 The nozzles, the main nozzle 106a and the additional nozzle 106b, may be advantageously made according to a geometry having the shape of a truncated cone, with increasing section by approaching the said outlet opening 48.

25 The relative axes may be in irrelevant manner mutually skew, or concurrent, for example substantially orthogonal, as well as said relative axes allow a proper transition from the main nozzle 106a to the additional nozzle 106b, and vice versa, as a function of the different vertical size of the cups 105a, 106b.

30 It is further to be highlighted that, the proposed distributing nozzle 106 is simple to be produced and is characterised by a restricted number of components, with full advantage for the producing costs, that therefore result very limited.

With reference to the Figures 12 to 15, a machine 201 is shown for preparing espresso coffee comprising a loader 202 of containers or tablets, of powder of coffee, provided with a

shutter 203, rotably supported by a base body of the machine 201.

With the shutter 203 there is associated cup means 205, having the shape of funnel, whose upper border 206 is suitable for supporting a filter 207 (Figure 18), consisting, for example, of a disk of metal sheet carrying a plurality of holes of small diameter, suitable for receiving a container.

The shutter 203 may be rotated around a vertical axis X1 in order to pass from a loading position, indicated as A1 in Figure 12, wherein an already used container is taken away from the cup 205 and possibly substituted by a new container, to an operating position, indicated as B1 in Figure 12, wherein the cup 205 results contained inside the base body 204 and the container is brought to interact with hot water distributing means, not shown.

The shutter 203 is provided at the front with a containing wall M extending along a curvilinear profile and shaped so as to adapt itself to the profile of the portion 208 of the base body 204 with which the shutter 203 comes to interact at the operating position B1.

Alternatively, a containing wall K may be provided having a linear profile, or a containing wall L provided with an appendage 209 protruding towards a user and suitable for constituting a handle arranged for facilitating the opening of the shutter 203 by the user self.

The shutter 203 is connected to a post 210 of the base body 204 by means of a first and a second connecting element 211a, 211b, shown in more detail in Figure 23, each of said connecting elements 211a, 211b comprising a first half-shell 212 and a second half-shell 213 mutually fixed to a screw 214 and identifying a first seat 215 arranged for receiving the post 210 and a second seat 216 arranged for receiving hinge means 217 firmly fixed to the shutter 203.

The hinge means 217 comprises a first pin 218 suitable for being received into the second seat 216 of the first connecting element 211a and a second pin 219 suitable for being received into the second seat 216 of the second connecting element 211b.

With reference to the Figures 14 and 15, it is shown how the first connecting element 211a and the second connecting element 211b may be height positioned in adjustable manner by causing them to slide along the post 210 and may then be blocked at the desired position by tightening the screws 215.

The distance between the first connecting element 211a and the second connecting element 211b may, therefore, be fixed so that a user, by raising the shutter 203, as shown in Figure 14, may cause a partial insertion of the first pin 218 into the second seat 216 of the first connecting element 211a, by disengaging, in such manner, the second pin 219 from the second seat 216 of the second connecting element 211b. The shutter 203, owing to a slight coupling clearance present between the first pin 218 and the relative seat 216, may then be rotated towards the exterior, as shown in Figure 15, and be removed from the base body 204 in order to be subjected to cleaning operations.

The shutter 203, owing to the use of the pair of connecting elements 211a, 211b, may be mounted apart and subsequently be fixed to the base body 204, when the said base body 204 has already been almost fully assembled: in such manner, advantageously, it is possible to produce universal base bodies 204 and to associate with said universal base bodies 204, during the final step of the producing cycle, a hinged shutter, or a sliding drawer, that will be described more in detail in the following, on the base of the requirements of a user.

That enables to remarkably simplify the production since a high degree of standardisation is introduced between the different types of machine 201 made by a same producer.

The shutter 203 further comprises hook coupling means 220 suitable for engaging with pressure blocking means 221 of known type suitable for holding the shutter 203 at the proper position during the operation of the machine 201.

Push-button means 222 is firmly fixed to the shutter 203, arranged for actuating switch means 223 connected to the base body 204, said switch means 223 being suitable for enabling the activation of the machine 201, and in particular the hot water to flow out from the above mentioned distributing means.

With reference to the Figures 16 to 20, a version is shown of the machine 201 wherein the shutter 203 is substituted by a drawer 203a sliding coupled with guide means 224 firmly fixed to support means 225 fixed to the base body 204.

The drawer 203a, in this case, is moving between a back position for loading-unloading the containers and an advanced working position.

The guide means 224 comprises tooth means 226 engaging into relative groove means 227 obtained in the drawer 203a. The drawer 203a further comprises socket means 228 arranged for receiving screw means, not shown, constituting an end stroke stop for the drawer 203 at its back position for loading-unloading the containers.

The tooth means 226 and the relative groove means 227 may show a rectangular section, as shown in the Figures 16, 17 and 18, or have a trapezoidal section with the sides diverging upwardly.

With reference to the Figures 18 and 19, the push-button means 222 is shown that is provided with elastically deformable elements 229 suitable for interacting with a moving portion 230 of the switch means 223. The elastically deformable means

229 may comprise for example flexible lamina means, or helical spring means

The deformability of the elements 229 enable that the said elements 229 may properly actuate the switch means 223 even in presence of positioning errors. Such elements 229, in effect, compensate for mounting inaccuracies with relative extensions or shortenings of small size.

The machine 201 further comprises pressure blocking means 221 co-operating with hook coupling means 220 obtained in the drawer 203a.

In order to block the drawer 203a, the said drawer 203a is pushed against the blocking means 221 so that the cup is held in position at the hot water distributing means. At the preparing end of a dose of coffee, the drawer 203a, pressed by the user, executes an additional section of stroke in direction of the blocking means 221 by releasing from the said blocking means 221 the hook coupling means 220, so that the said drawer 203a may be brought to its position for loading-unloading containers.

Both the switch means 223 and the pressure blocking means 221 are fixed to the support means 225; that allows that they are placed in the proper relative positions in order to be able to be simultaneously, respectively actuated, during the operating phase, by the push-button means 222 and by the hook coupling means 220 mounted aboard the drawer 203a.

In this manner, the assembly of the machine 1 results quite simple, as the switch means 223 and the blocking means 221 may be fixed apart to the support means 225 and subsequently the support means 225 may be assembled with the base body 204 by reducing the risks of mounting errors.

With reference to the Figures 21 and 22, the cup means 205 is shown arranged for receiving containers of different sizes.

The cup means 205 is provided with centring means 231 suitable for being received by form coupling into relative notches 232 obtained in the drawer 203a, or in the shutter 203.

5 The cup means 205 shows equal external dimensions and is internally provided with filter holding means 233 suitable for receiving containers of pre-established dimension, for example containers of great dimensions, in the version of which at the Figure 21, or containers of more limited dimensions, in the version of which at the Figure 22.

10 In the case it is necessary to vary the amount of espresso coffee to be prepared, it is sufficient to extract one of said cup means 205 and to substitute with another one of said cup means 205 having filter holding means 233 such to support a container of suitable dimensions and therefore suitable for 15 preparing the desired dose of coffee.

The cup means 205 is provided with a lower portion 234 provided with a distributing opening 235 through which the prepared espresso coffee is poured into a proper container and may be taken by a consumer.

20 With the said lower portion 234 there is associated a distributing nozzle, not shown, providing for facilitating the prepared coffee to be transferred from the cup means 205 to the above-mentioned container.

25 It is to be noticed that all above has been described for exemplifying and not restrictive purpose, therefore possible variances are noticed in any way to fall into the protective domain of the present technical solution, as above described and in the following claimed.

## CLAIMS

1. Apparatus for distributing hot beverages and/or infusions, in particular coffee, comprising a casing (2), a heat exchanger (3), a drawer (41) provided with a container holding filter support (42; 42a) communicating with a collecting chamber (44) of said beverages and/or infusions externally flowing out by means of a distributing opening (48), characterised in that, it further comprises expelling arm means (14) arranged for expelling said container from said filter support (42; 42a) after that said container has been used.
2. Apparatus according to the claim 1, wherein said expelling arm means is placed side by side with said heat exchanger (3).
3. Apparatus according to the claim 1, or 2, wherein said expelling arm means (14) is arranged near said filter support (42; 42a), parallel to this later, and is oscillating around a rotating axis (15) of redirecting means (16).
4. Apparatus according to the claim 3, and further comprising control member (18, 20), associated with said redirecting means (16) and said heat exchanger (3) and suitable for actuating said expelling arm means (14), from a rest position (P1), for intercepting said container (10) arranged in said filter support (42; 42a) and for extracting said container (10) from this later filter support (42; 42a), up to an operating position (P2) in order to unload said container (10) towards a collecting site.
5. Apparatus according to the claim 4, wherein said control means provides protruding means (18) provided with an end fixed to said heat exchanger (3).
6. Apparatus according to the claim 5, wherein said protruding means (18) comprises a further end, opposed to said an end, shaped so as to intercept, during the movement of said heat exchanger (3) from said lower operating position (S1) to

said upper not-operating position (S2), main cam means (20), provided on the external surface of said redirecting means (16) in order to cause the rotation, in a direction (W), of said redirecting means (16) around said axis 15 in order to 5 actuate said expelling arm means (14) from said rest position (P1) to said operating position (P2).

7. Apparatus according to the claim 5, wherein said protruding means (18) comprises a further end, opposed to said an end, shaped so as to intercept, during the movement of said 10 heat exchanger (3) from said lower operating position (S1) to said upper not-operating position (S2), lever means connected to said redirecting means (16) in order to cause the rotation, in a direction (W), of said redirecting means (16) around said axis 15 in order to actuate said expelling arm means (14) from 15 said rest position (P1) to said operating position (P2).

8. Apparatus according to any of the claims 4 to 7, and further comprising elastic members (7) arranged for driving back said expelling arm means (14), in consequence of the unloading of said container (10) into said collecting site, 20 from said operating position (P2) to said rest position (P1).

9. Apparatus according to the claim 8, wherein said elastic members (7) comprise a spiral spring having a fixed first end and a free second end acting on said expelling arm means (14).

10. Apparatus according to any of the preceding claims, 25 wherein said expelling arm means (14) shows an arcuated shape so as to fully intercept said container (10).

11. Apparatus according to any of the claims 3 to 10, wherein said redirecting means (16) comprises a hub centred on said vertical axis (15).

30 12. Apparatus according to the claim 4, wherein said control means provides actuating members co-operating with sensor means and suitable for actuating said redirecting means (16) for the movement of said expelling arm means (14) from said rest position (P1) to said operating position (P2).

13. Apparatus according to the claim 12, wherein said actuating means comprises electromagnet means.
14. Apparatus according to the claim 13, wherein said electromagnet means comprises double-acting electromagnet means.
- 5 15. Apparatus according to the claim 13, wherein said electromagnet means comprises single acting electromagnet means co-operating with contrast spring means.
- 10 16. Apparatus according to the claim 12, wherein said actuating means comprises pneumatic actuating means.
17. Apparatus according to the claim 12, wherein said actuating means comprises hydraulic actuating means.
- 15 18. Apparatus according to the claim 17, wherein said hydraulic actuating means is actuated by pump means that also controls a moving device for said heat exchanger (3).
19. Apparatus according to the claim 17, and comprising independent pump means arranged for actuating said hydraulic actuating means.
- 20 20. Apparatus according to the claim 12, wherein said actuating means operates said expelling arm means (14) by means of lever means interposed between said actuating means and said expelling arm means (14).
21. Apparatus according to any of the preceding claims, and further comprising a groove (40) designed to be interested by guides (23) downwardly provided to said drawer (41) in order to move said drawer (41) between a first stroke end (5) corresponding to the complete extraction of said filter support (42; 42a) for introducing a new container (10), and a second stroke end (4), corresponding to the positioning of said filter support (42; 42a) at said heat exchanger (3).
- 30 22. Apparatus according to the claim 21, wherein at said first stroke end (4) a micro-switch (50) is provided

arranged for activating the distribution of said beverages and/or infusions.

23. Apparatus according to any of the preceding claims, and further comprising at least a seat (102) for housing container (105a, 105b) with variable vertical size, said seat downwardly identifying a support plane (103) for such containers (105a, 105b) and upwardly at least a distributing opening (48) of said beverages.

10 24. Apparatus according to the claim 23, and further comprising a distributing nozzle (106) comprising a main nozzle (106a) and at least an additional nozzle (106b) stiffly associated with said main nozzle (106a), said main nozzle (106a) and said at least an additional nozzle (106b) being oscillating around an axis (X) substantially parallel to said support plane.

15 25. Apparatus according to the claim 24, wherein said main nozzle (106) is removably hinged to an upper region of said housing seat (102) in order to convey said beverages flowing out from said distributing opening (48) into said container (105a) with smaller vertical size.

20 26. Apparatus according to the claim 24, or 25, wherein said at least an additional nozzle (106b) is suitable for conveying said beverages, flowing out from said distributing opening (48), into said container (105b) with greater vertical size.

25 27. Apparatus according to any of the claims 24 to 26, wherein said at least an additional nozzle (106b) has a longitudinal extension smaller than the longitudinal extension of said main nozzle (106a).

30 28. Apparatus according to any of the claims 24 to 27, wherein said main nozzle (106a) is laterally hinged with respect to said outlet opening (48).

29. Apparatus according to any of the claims 24 to 28, wherein said main nozzle (106a) is shaped according to a

geometry having the shape of a truncated cone, with a growing section by approaching said outlet opening (48).

30. Apparatus according to any of the claims 24 to 29, wherein said additional nozzle (106b) is shaped according to a geometry having the shape of a truncated cone, with a decreasing section by approaching said container (105b) with greater vertical size.

5 31. Apparatus according to any of the claims 24 to 30, wherein said main nozzle (106a) and said additional nozzle (106b) show mutually skew axes.

10 32. Apparatus according to any of the claims 24 to 30, wherein said main nozzle (106a) and said additional nozzle (106b) show mutually concurrent axes.

15 33. Apparatus according to any of the claims 24 to 30, wherein said main nozzle (106a) and said additional nozzle (106b) show mutually orthogonal axes.

34. Apparatus according to any of the claims 24 to 33, wherein said main nozzle (106a) and said additional nozzle (106b) are of interchangeable type.

20 35. Apparatus according to any of the claims 24 to 34, wherein said main nozzle (106a) may be associated with a plurality of additional nozzles (106b) of different longitudinal extensions.

36. Apparatus according to any of the preceding claims, and further comprising receiving means arranged for receiving said container (10).

25 37. Apparatus according to the claim 36, wherein with said receiving means (42; 42a; 323) extracting means (300) is associated arranged for transferring said container (10) from a lowered position (A2) wherein said container (10) is in contact with said receiving means (42; 42a; 323) to a raised position (B2) wherein said container (10) is placed at distance from said receiving means (42; 42a; 323).

30

38. Apparatus according to the claim 37, wherein said extracting means (300) comprises pushing means (301) sliding inside a seat (303) delimited by a tubular support (302) firmly fixed to said receiving means (42).
- 5 39. Apparatus according to the claim 38, wherein said receiving means (42) is provided with a hole (304) through which said pushing means (301) results passing in order to interact with said container (10).
- 10 40. Apparatus according to the claim 38, or 39, wherein said pushing means (301) is fixed to a small plate (307) resting on a first end (308) of a spring (309), said spring (309) being provided with a second end (310) resting on funnel filter holding means (312) supporting said receiving means (42).
- 15 41. Apparatus according to the claim 37, wherein said pushing means (301) is sliding inside a further seat (303a) obtained inside a casing (313) firmly fixed to said receiving means (42).
- 20 42. Apparatus according to the claim 41, wherein said pushing means (301) is fixed to a further small plate (307a) vertically moving inside a chamber (314) laterally delimited by said casing (313) and downwardly closed by a plate (315).
- 25 43. Apparatus according to the claim 42, wherein inside said chamber (314) a further spring (309a) is contained, having a further first end associated with said further small plate (307a) and a further second end (310a) lying by resting on said plate (315).
- 30 44. Apparatus according to the claim 37, wherein said extracting means (300) comprises elastic thread means (316).
45. Apparatus according to the claim 44, wherein said elastic thread means comprises a first thread (316a).

46. Apparatus according to the claim 45, wherein said elastic thread means further comprises a second thread (316b).

47. Apparatus according to the claim 46, wherein said first thread (316a) and said second thread (316b) are shaped so as to constitute a spring suitable for interacting with said container (10) in order to raise said container (10) with respect to a bottom region (324) of said receiving means (42).

48. Apparatus according to the claim 37, wherein said extracting means (300) comprises filter support means (42a) vertically moving inside a hollow (319) identified inside funnel filter holding means (312) supporting said filter support means (42).

49. Apparatus according to the claim 48, wherein said funnel filter holding means (312) is further provided with a hollow arranged for receiving said container (10) during the passage of diluting liquid through said container (10) in order to prepare a dose of said beverages.

50. Apparatus according to the claim 48, or 49, wherein said filter support means (42a) comprises an upper wall (320) provided with a plurality of holes arranged for enabling the passage of said beverages and a side wall (321) arranged for interacting with said hollow (319) in order to lead the translation of said filter support means (42a).

51. Apparatus according to any of the claims 48 to 50, wherein between said filter support means (42a) and said funnel filter holding means (312) spring means (322) is interposed arranged for transferring said filter support means (42a) from said lowered position (A2) to said raised position (B2).

52. Distributing nozzle for distributing machines of beverages, said distributing machines comprising at least a housing seat (102) of containers (105a, 105b) having

height comprised between a range of heights, said seat identifying downwardly a support plane (103) for said containers (105a, 105b) and upwardly at least a distributing opening (48) of said beverages, 5 characterised in that it comprises nozzle means (106, 106b) suitable for being applied at an opening distributing the beverage.

53. Nozzle, according to the claim 52, wherein said nozzle means (106) comprises a main nozzle (106a), and at least 10 an additional nozzle (106b) associated with said main nozzle (106a), said main nozzle (106a) and said at least an additional nozzle (106b) being oscillating so that the additional nozzle (106b) may enable the beverage to be distributed through the said additional nozzle (106b) 15 only when the main nozzle (106a) is moved from its own distributing position.
54. Nozzle according to the claim 53, wherein said additional nozzle (106b) is mounted in oscillating manner around an axis substantially parallel to said support plane.
55. Distributing nozzle according to the claim 53, or 54, 20 wherein said main nozzle (106a) is removably hinged to an upper region of said housing seat (102) in order to convey said beverages flowing out from said distributing opening (48) into said container (105a) having a 25 relatively low height.
56. Distributing nozzle according to any of the claims 53 to 55, wherein said at least an additional nozzle (106b) is suitable for conveying said beverages flowing out from 30 said distributing opening (48) into said container (105b) having a relatively high height.
57. Distributing nozzle according to any of the claims 53 to 56, wherein said at least an additional nozzle (106b) has a longitudinal extension lower than the longitudinal extension of said main nozzle (106a).

58. Distributing nozzle according to any of the claims 53 to 57, wherein said main nozzle (106a) is laterally hinged with respect to said distributing opening (48).
- 5 59. Distributing nozzle according to any of the claims 53 to 58, wherein said main nozzle (106a) is shaped according to a geometry having the shape of a truncated cone, with section growing by approaching said outlet opening (B).
- 10 60. Distributing nozzle according to any of the claims 53 to 59, wherein said additional nozzle (106b) is shaped according to a geometry having the shape of a truncated cone, with section decreasing by approaching said container (105b) with greater vertical size.
- 15 61. Distributing nozzle according to any of the claims 53 to 60, wherein said main nozzle (106a) and said additional nozzle (106b) show mutually skew axes.
62. Distributing nozzle according to any of the claims 53 to 61, wherein said main nozzle (106a) and said additional nozzle (106b) show mutually concurrent axes.
- 20 63. Distributing nozzle according to any of the claims 53 to 62, wherein said main nozzle (106a) and said additional nozzle (106b) show mutually orthogonal axes.
64. Distributing nozzle according to any of the claims 53 to 63, wherein said main nozzle (106a) and said additional nozzle (106b) are of interchangeable type.
- 25 65. Distributing nozzle according to any of the claims 53 to 64, wherein said main nozzle (106a) may be associated with a plurality of additional nozzles (106b) of different longitudinal extensions.
- 30 66. Nozzle according to any of the claims 53 to 65, wherein said main nozzle (106a) and said additional nozzle (106b) are firmly connected each other.
67. Distributing nozzle according to any of the claims 53 to 66, wherein said distributing machines of beverages comprise machines for distributing coffee.

68. Distributing nozzle according to the claim 67, wherein said machines for distributing coffee use containers.
69. Apparatus for preparing beverages, comprising receiving means (42; 42a; 323) suitable for receiving container means (10) containing a base substance of the beverage to be prepared, characterised in that with said receiving means (42; 42a; 323) extracting means (300) is associated arranged for transferring said container means (10) from a lowered position (A2) wherein said container means (10) is in contact with said receiving means (42; 42a; 323) to a raised position (B2) wherein said container means (10) is placed at distance from said receiving means (42; 42a; 323).  
5
10. Apparatus according to the claim 69, wherein said extracting means (300) comprises pushing means (301) sliding inside a seat (303) delimited by a tubular support (302) firmly connected to said receiving means (42).  
15
20. Apparatus according to the claim 70, wherein said receiving means (42) is provided with a hole (304) through which said pushing means (301) results passing in order to interact with said container means (10).  
25
72. Apparatus according to the claim 70, or 71, wherein said pushing means (301) is fixed to a small plate (307) resting on a first end (308) of a spring (309), said spring (309) being provided with a second end (310) resting on funnel filter holding means (312) supporting said receiving means (42).  
73. Apparatus according to the claim 69, wherein said pushing means (301) is sliding inside a further seat (303a) obtained in a casing (313) firmly connected to said receiving means (42).  
30
74. Apparatus according to the claim 73, wherein said pushing means (301) is fixed to a further small plate (307a)

vertically moving inside a chamber (314) laterally delimited by said casing (313) and downwardly closed by a plate (315).

75. Apparatus according to the claim 74, wherein inside said chamber (314) a further spring (309a) is contained having a further first end associated with said further small plate (307a) and a further second end (310a) lying by resting on said plate (315).
76. Apparatus according to the claim 69, wherein said extracting means (300) comprises elastic thread means (316).
77. Apparatus according to the claim 76, wherein said elastic thread means comprises a first thread (316a).
78. Apparatus according to the claim 77, wherein said elastic thread means further comprises a second thread (316b).
79. Apparatus according to the claim 78, wherein said first thread (313a) and said second thread (316b) are shaped so as to constitute a spring suitable for interacting with said container means (10) in order to raise said container means (10) with respect to a bottom region (324) of said receiving means (42).
80. Apparatus according to the claim 69, wherein said extracting means (300) comprises filter support means (42a) vertically moving inside a hollow (319) identified inside funnel filter holding means (312) supporting said filter support means (42).
81. Apparatus according to the claim 80, wherein said funnel filter holding means (312) is further provided with a hollow (323) arranged for receiving said container means (10) during the passage of diluting liquid through this later container means (10) for preparing a dose of said beverages.
82. Apparatus according to the claim 80, or 81, wherein said filter support means (42a) comprises an upper wall (320)

provided with a plurality of holes arranged for enabling the passage of said beverages and a side wall (321) arranged for interacting with said hollow (319) in order to lead the translation of said filter support means (42a).

5

83. Apparatus according to any of the claims 80 to 82, wherein between said filter support means (42a) and said funnel filter holding means (312) spring means (322) is interposed arranged for transferring said filter support means (42a) from said lowered position (A2) to said raised position (B2).

10

84. Extracting device suitable for being associated with an apparatus (1) for preparing beverages, said apparatus (1) comprising receiving means (42; 42a; 323) suitable for receiving container means (10) containing a base substance to be prepared, characterised in that it comprises extracting means (300) arranged for transferring said container means (10) from a lowered position (A2) wherein said container means (10) is in contact with said receiving means (42; 42a; 323) to a raised position (B2) wherein said container means (10) is placed at distance from said receiving means (42; 42a; 323).

15

85. Device according to the claim 84, wherein said extracting means (300) comprises pushing means (301) sliding inside a seat (303) delimited by a tubular support (302) firmly fixed to said receiving means (42).

20

86. Device according to the claim 85, wherein said receiving means (42) is provided with a hole (304) through which said pushing means (301) results passing in order to interact with said container means (10).

25

87. Device according to the claim 85, or 86, wherein said pushing means (301) is fixed to a small plate (307) resting on a first end (308) of a spring (309), said

30

spring (309) being provided with a second end (310) resting on funnel filter holding means (312) supporting said receiving means (42).

88. Device according to the claim 84, wherein said pushing means (301) is sliding inside a further seat (303a) obtained in a casing (313) firmly fixed to said receiving means (42).
89. Device according to the claim 88, wherein said pushing means (301) is fixed to a further small plate (307a) vertically moving inside a chamber (314) laterally delimited by said casing (313) and downwardly closed by a plate (315).
90. Device according to the claim 89, wherein inside said chamber (314) a further spring is contained (309a) having a further first end associated with said further small plate (307a) and a further second end (310a) lying by resting on said plate (315).
91. Device according to the claim 84, wherein said extracting means (300) comprises elastic thread means (316).
92. Device according to the claim 91, wherein said elastic thread means comprises a first thread (316a).
93. Device according to the claim 84, wherein said elastic thread means further comprises a second thread (316b).
94. Device according to the claim 93, wherein said first thread (313a) and said second thread (316b) are shaped so as to constitute a spring suitable for interacting with said container means (10) in order to raise said container means (10) with respect to a bottom region (324) of said receiving means (42).
95. Device according to the claim 94, wherein said extracting means (300) comprises filter support means (42a) vertically moving inside a hollow (319) identified inside funnel filter holding means (312) supporting said filter support means (42).

96. Device according to the claim 95, wherein said funnel filter holding means (312) is further provided with a hollow (323) arranged for receiving said container means (10) during the passage of diluting liquid through this later container means (10) for preparing a dose of said beverage.  
5
97. Device according to the claim 95, or 96, wherein said filter support means (42a) comprises an upper wall (320) provided with a plurality of holes arranged for enabling the passage of said beverages and a side wall (321) arranged for interacting with said hollow (319) in order to lead the translation of said filter support means (42a).  
10
98. Device according to any of the claims 95 to 97, wherein between said filter support means (42a) and said funnel filter holding means (312) spring means (322) is interposed arranged for transferring the filter support means (42a) from said lowered position (A2) to said raised position (B2).  
15
99. Apparatus for preparing beverages, comprising receiving means (203; 203a) suitable for receiving container means containing a base substance of the beverage to be prepared and moving between a loading position (A1) wherein said receiving means (203; 203a) is arranged externally to a base body (204) of said apparatus (201) in order to receive said container means and an operating position (B1) wherein said receiving means (203; 203a) is arranged internally to said base body (204) in order to bring said container means to interact with liquid distributing means, characterised in that said receiving means (3) is fixed in removable manner to said base body (204).  
20
- 25
- 30

100. Apparatus according to the claim 99, wherein said receiving means (203) is associated with said base body by means of hinge means (217).
101. Apparatus according to the claim 100, wherein said hinge means (217) comprises first pin means (218) and second pin means (219) housed in respective seat means (216).
102. Apparatus according to the claim 101, wherein said first pin means (218) and said second pin means (219) is associated with said receiving means (203).
103. Apparatus according to the claim 101, or 102, wherein said first pin means (218) and said second pin means (219) extends at opposing sides of said receiving means (203) in order to engage respectively from the bottom and from above said respective seat means (216).
104. Apparatus according to any of the claims 101 to 103, wherein said first pin means (218) and said second pin means (219) are suitable for being extracted from said seat means (216).
105. Apparatus according to any of the claims 101 to 104, wherein said first pin means (218) and said second pin means (219) are arranged at a distance such that the receiving means (203) may be disengaged from said base body (204) by raising said receiving means (203) along the longitudinal axis of said first pin means (218) and said second pin means (219) and rotating said receiving means (203) towards the exterior.
106. Apparatus according to any of the claims 100 to 105, wherein said hinge means (217) is connected to said base body (204) by means of connecting means (211a, 211b).
107. Apparatus according to the claim 106, wherein said connecting means (211a, 211b) comprises first half-shell means (212) and second half-shell means (213) mutually fixed by a screw (214).

108. Apparatus according to the claim 106, or 107, when depending from any of the claims 101 to 105, wherein said connecting means (211a, 211b) identifies said seat means (216).

5 109. Apparatus according to any of the claims 106 to 108, wherein said connecting means (211a, 211b) is suitable for being height positioned on post means (210) of said base body (204).

10 110. Apparatus according to the claim 99, wherein said receiving means (203a) is sliding along guide means (224) associated with said base body (204).

15 111. Apparatus according to the claim 110, wherein said guide means (224) comprises tooth means (226) engaging in groove means (227) obtained in said receiving means (203a).

112. Apparatus according to the claim 111, wherein said tooth means (226) and said groove means (227) show a rectangular section.

20 113. Apparatus according to the claim 111, wherein said tooth means (226) and said groove means (227) show a trapezoidal section.

25 114. Apparatus according to any of the claims 110 to 113, wherein said receiving means (203a) further comprises socket means (228) arranged for receiving screw means acting as end stroke stop for said receiving means (203a).

115. Apparatus according to any of the claims 99 to 114, wherein said receiving means (203; 203a) is provided with cup means (205) suitable for receiving said container means.

30 116. Apparatus according to the claim 115, wherein said cup means (205) is suitable for being extracted from said receiving means (203; 203a).

117. Apparatus according to the claim 115, or 116, wherein said cup means (205) is provided with centring means (231) suitable for being received by form coupling into relative notch means (232) obtained in said receiving means (203; 203a).  
5
118. Apparatus according to any of the claims 115 to 117, wherein said cup means comprises a plurality of cups (205) mutually interchangeable.
119. Apparatus according to the claim 118, wherein said cups (205) show external dimensions equal each other and each of said cups (205) is internally provided with filter holding means (233) suitable for receiving containers of a pre-established size.  
10
120. Apparatus according to any of the claims 115 to 119, wherein said cup means (205) is provided with a lower portion (234) provided with a distributing opening (235) for said beverages.  
15
121. Apparatus according to the claim 120, wherein a distributing nozzle is associated with said lower portion (234).  
20
122. Apparatus according to any of the claims 98 to 121, and further comprising electric switch means (223) suitable for controlling the actuation of said apparatus (201).
123. Apparatus according to the claim 122, wherein to said receiving means (203; 203a) push-button means (222) is firmly fixed suitable for interacting with said electric switch means (223).  
25
124. Apparatus according to the claim 123, wherein said push-button means (222) comprises elastically deformable elements (229) arranged for compensating for stroke inaccuracies of said receiving means (203; 203a).  
30
125. Apparatus according to the claim 124, wherein said elastically deformable elements (229) comprise flexible lamina means.

126. Apparatus according to the claim 124, wherein said elastically deformable elements (229) comprise helical spring means.
- 5 127. Apparatus according to any of the claims 99 to 126, and further comprising pressure blocking means (221) suitable for holding said receiving means (203; 203a) blocked at said operating position (B1).
- 10 128. Apparatus according to the claim 127, wherein said receiving means (203; 203a) comprises hook coupling means (220) suitable for engaging with said pressure blocking means (221).
- 15 129. Apparatus according to the claim 127, or 128, when depending from any of the claims 122 to 126, wherein said electric switch means (223) and said pressure blocking means (221) are connected to support means (225).
- 20 130. Apparatus according to the claim 129, wherein said support means is suitable for being fixed to said base body (204).
- 25 131. Apparatus for preparing beverages, comprising receiving means (203; 203a) provided with cup means (205) suitable for receiving container means of a base substance of the beverage to be prepared, characterised in that said cup means (205) is suitable for being extracted from said receiving means (203; 203a).
- 30 132. Apparatus according to the claim 131, wherein said cup means (205) is provided with centring means (231) suitable for being received by form coupling into relative notch means (232) obtained in said receiving means (203; 203a).
133. Apparatus according to the claim 131, or 132, wherein said cup means comprises a plurality of cups (205) mutually interchangeable.
134. Apparatus according to the claim 133, wherein said cups (205) show external dimensions mutually equal and each of

said cups is internally provided with filter holding means (233) suitable for receiving container of a pre-established size.

135. Apparatus according to any of the claims 131 to 134, wherein said cup means (205) is provided with a lower portion (234) provided with a distributing opening (235) for said beverages.
136. Apparatus according to the claim 135, wherein a distributing nozzle is associated with said lower portion (234).
137. Apparatus according to any of the claims 131 to 136, wherein said receiving means (203; 203a) is moving between a loading position (A1) wherein said receiving means (203; 203a) is arranged externally to a base body (204) of said apparatus (201) in order to receive said container means and an operating position (B1) wherein said receiving means (203; 203a) is arranged internally to said base body (204) in order to bring said container means to interact with liquid distributing means.
138. Apparatus according to the claim 137, wherein said receiving means (203; 203a) is fixed in removable manner to said base body (204).
139. Apparatus according to the claim 138, wherein said receiving means (203) is associated with said base body (204) by means of hinge means (217).
140. Apparatus according to the claim 139, wherein said hinge means (217) comprises first pin means (218) and second pin means (219) housed in respective seat means (216).
141. Apparatus according to the claim 140, wherein said first pin means (218) and said second pin means (219) are associated with said receiving means (203).
142. Apparatus according to the claim 140, or 141, wherein said first pin means (218) and said second pin means (219) extend at opposing sides of said receiving means

(203) in order to engage respectively from the bottom and from above said respective seat means (216).

143. Apparatus according to any of the claims 140 to 142, wherein said first pin means (218) and said second pin means (219) are suitable for being extracted from said seat means (216).

144. Apparatus according to any of the claims 140 to 143, wherein said first pin means (218) and said second pin means (219) are arranged at a distance such that the receiving means (203) may be disengaged from said base body (204) by raising said receiving means (203) along the longitudinal axis of said first pin means (218) and said second pin means (219) and rotating said receiving means (203) towards the exterior.

145. Apparatus according to any of the claims 139 to 144, wherein said hinge means (217) is connected to said base body (204) by means of connecting means (211a, 211b).

146. Apparatus according to the claim 145, wherein said connecting means (211a, 211b) comprises first half-shell means (212) and second half-shell means (213) mutually fixed by a screw (214).

147. Apparatus according to the claim 145, or 146, when depending from any of the claims 140 to 144, wherein said connecting means (211a, 211b) identifies said seat means (216).

148. Apparatus according to any of the claims 145 to 147, wherein said connecting means (211a, 211b) is suitable for being height positioned on post means (10) of said base body (204).

149. Apparatus according to the claim 148, wherein said receiving means (203a) is sliding along guide means (224) associated with said base body (204).

150. Apparatus according to the claim 149, wherein said guide means (224) comprises tooth means (226) engaging into

groove means (227) obtained in said receiving means (203a).

151. Apparatus according to the claim 150, wherein said tooth means (226) and said groove means (227) show a  
5 rectangular section.
152. Apparatus according to the claim 150, wherein said tooth means (226) and said groove means (227) show a trapezoidal section.
153. Apparatus according to any of the claims 149 to 152,  
10 wherein said receiving means (203a) further comprises socket means (228) arranged for receiving screw means operating as end stroke stop for said receiving means (203a).
154. Apparatus according to any of the claims 131 to 153, end  
15 further comprising electric switch means (223) suitable for controlling the activation of said apparatus (201).
155. Apparatus according to the claim 154, wherein to said receiving means (203; 203a) push-button means (222) is firmly fixed suitable for interacting with said electric  
20 switch means (223).
156. Apparatus according to the claim 155, wherein said push-button means (222) comprises elastically deformable elements (229) arranged for compensating stroke inaccuracies of said receiving means (203; 203a).
157. Apparatus according to the claim 156, wherein said elastically deformable elements (229) comprise lamina  
25 flexible means.
158. Apparatus according to the claim 156, wherein said elastically deformable elements (229) comprise helical  
30 spring means.
159. Apparatus according to any of the claims 137 to 158, and further comprising pressure blocking mans (221) suitable for holding said receiving means (203), 203a) blocked in said operating position (B1).

160. Apparatus according to the claim 159, wherein said receiving means (203; 203a) comprises hook coupling means (220) suitable for engaging with said pressure blocking means (221).
- 5 161. Apparatus according to the claim 159, or 160, when depending from any of the claims 14 to 158, wherein said electric switch means (223) and said pressure blocking means (221) is connected to support means (225).
- 10 162. Apparatus according to the claim 161 when depending from any of the claims 137 to 160, wherein said support means are suitable for being fixed to said base body (204).
- 15 163. Apparatus for preparing beverages, comprising receiving means (203; 203a) suitable for receiving basic container means of a beverage to be prepared and electric switch means (223) suitable for enabling said apparatus to be activated, characterised in that to said receiving means (203; 203a) deformable push-button means is firmly fixed, suitable for interacting with said electric switch means (23) in order to control said electric switch means (23).
- 20 164. Apparatus according to the claim 163, wherein said push-button means (222) comprises elastically deformable elements (229) arranged for compensating stroke inaccuracies of said receiving means (203; 203a).
- 25 165. Apparatus according to the claim 164, wherein said elastically deformable elements (229) comprise flexible lamina means.
166. Apparatus according to the claim 164, wherein said elastically deformable elements (229) comprise helical spring means.
- 30 167. Apparatus according to any of the claims 163 to 166, and further comprising pressure blocking means (221) suitable for blocking said receiving means (203; 203a).
168. Apparatus according to the claim 167, wherein said receiving means (203; 203a) comprises hook coupling means

(220) suitable for engaging with said pressure blocking means (221).

169. Apparatus according to the claim 167, or 168, wherein said electric switch means (223) and said pressure blocking means (221) are connected to support means (225).

170. Apparatus according to the claim 169, wherein said support means is suitable for being fixed to a base body (204) of said apparatus (201).

171. Apparatus according to the claim 170, wherein said receiving means (203; 203a) is moving between a loading position (A1) wherein said receiving means (203; 203a) is arranged externally to said base body (204) in order to receive said container means and an operating position (B1) wherein said receiving means (203; 203a) is arranged internally to said base body (204) in order to bring said container means to interact with liquid distributing means.

172. Apparatus according to the claim 171, wherein said receiving means (203; 203a) is fixed in removable manner to said base body (204).

173. Apparatus according to the claim 172, wherein said receiving means (203) is associated with said base body (204) by means of hinge means (217).

174. Apparatus according to the claim 173, wherein said hinge means (217) comprises first pin means (218) and second pin means (219) housed in respective seat means (216).

175. Apparatus according to the claim 174, wherein said first pin means (218) and said second pin means (219) are associated with said receiving means (203).

176. Apparatus according to the claim 174, or 175, wherein said first pin means (218) and said second pin means (219) extend at opposing sides of said receiving means

(203) in order to engage respectively from the bottom and from above said respective seat means (216).

177. Apparatus according to any of the claims 174 to 176, wherein said first pin means (218) and said second pin means (219) are suitable for being extracted from said seat means (216).

178. Apparatus according to any of the claims 174 to 177, wherein said first pin means (218) and said second pin means (219) are arranged at a distance such that the receiving means (203) may be disengaged from said base body (204) by raising said receiving means (203) along the longitudinal axis of said first pin means (218) and said second pin means (219) and rotating said receiving means (203) towards the exterior.

179. Apparatus according to any of the claims 173 to 178, wherein said hinge means (217) is connected to said base body (204) by means of connecting means (211a, 211b).

180. Apparatus according to the claim 179, wherein said connecting means (211a, 211b) comprises first half-shell means (212) and second half-shell means (213) mutually fixed by a screw (214).

181. Apparatus according to the claim 179, or 180, when depending from any of the claims 174 to 178, wherein said connecting means (211a, 211b) identifies said seat means (216).

182. Apparatus according to any of the claims 179 to 181, wherein said connecting means (211a, 211b) are suitable for being height positioned on post means (210) of said base body (204).

183. Apparatus according to the claim 172, wherein said receiving means (203a) is sliding along guide means (224) associated with said base body (204).

184. Apparatus according to the claim 183, wherein said guide means (224) comprises tooth means (226) engaging in

groove means (227) obtained in said receiving means (203a).

185. Apparatus according to the claim 184, wherein said tooth means (226) and said groove means (227) show a rectangular section.

186. Apparatus according to the claim 184, wherein said tooth means (226) and said groove means (227) show a trapezoidal section.

187. Apparatus according to any of the claims 183 to 186, wherein said receiving means (203a) further comprises socket means (228) arranged for receiving screw means functioning as end stroke stop for said receiving means (203a).

188. Apparatus according to any of the claims 163 to 187, wherein said receiving means (203; 203a) is provided with cup means (205) suitable for receiving said container means.

189. Apparatus according to the claim 188, wherein said cup means (205) is suitable for being extracted from said receiving means (203; 203a).

190. Apparatus according to the claim 188, or 189, wherein said cup means (205) is provided with centring means (231) suitable for being received by form coupling into relative notch means (232) obtained in said receiving means (203; 203a).

191. Apparatus according to any of the claims 188 to 191, wherein said cup means comprises a plurality of cups (205) mutually interchangeable.

192. Apparatus according to the claim 191, wherein said cups (205) show external dimensions mutually equal and each of said cups is internally provided with filter holding means (233) suitable for receiving containers of a pre-established size.

193. Apparatus according to any of the claims 190 to 192, wherein said cup means (205) is provided with a lower portion (234) provided with a distributing opening (235) for said beverages.
- 5 194. Apparatus according to the claim 193, wherein to said lower portion (234) a distributing nozzle is associated.
195. Drawer means suitable for being associated with an apparatus for preparing beverages, comprising receiving means (203; 203a) suitable for receiving container means containing a base substance of the beverage to be prepared and moving between a loading position (A1) wherein said receiving means (203; 203a) is arranged externally to a base body (204) of said apparatus (201) in order to receive said container means and an operating position (B1) wherein said receiving means (203; 203a) is arranged internally to said base body (204) in order to bring said container means to interact with liquid distributing means, characterised in that said receiving means (3) is suitable for being fixed in removable manner to said base body (204).
- 10 196. Drawer means according to claim 195, wherein said receiving means (203) is suitable for being fixed to said base body by means of hinge means (217).
- 15 197. Drawer means according to claim 196, wherein said hinge means (217) comprises first pin means (218) and second pin means (219) housed in respective seat means (216).
- 20 198. Drawer means according to claim 197, wherein said first pin means (218) and said second pin means (219) are associated with said receiving means (203).
- 25 199. Drawer means according to claim 197, or 198, wherein said first pin means (218) and said second pin means (219) extend at opposing sides of said receiving means (203) in order to engage respectively from the bottom and from above said respective seat means (216).

200. Drawer means according to any of the claims 197 to 199, wherein said first pin means (218) and said second pin means (219) are suitable for being extracted from said seat means (216).
- 5 201. Drawer means according to any of the claims 197 to 200, wherein said first pin means (218) and said second pin means (219) are arranged at a distance such that the receiving means (203) may be disengaged from said base body (204) by raising said receiving means (203) along the longitudinal axis of said first pin means (218) and said second pin means (219) and by rotating said receiving means (203) towards the exterior.
- 10 202. Drawer means according to any of the claims 197 to 201, wherein said hinge means (217) is connected to said base body (204) by means of connecting means (211a, 211b).
- 15 203. Drawer means according to claim 202, wherein said connecting means (211a, 211b) comprises first half-shell means (212) and second half-shell means (213) mutually fixed by a screw (214).
- 20 204. Drawer means according to claim 202, or 203, when depending from any of the claims 197 to 201, wherein said connecting means (211a, 211b) identifies said seat means (216).
- 25 205. Drawer means according to any of the claims 202 to 204, wherein said connecting means (211a, 211b) are suitable for being height positioned on post means (210) of said base body (204).
- 30 206. Drawer means according to claim 195, wherein said receiving means (203a) is sliding along guide means (224) associated with said base body (204).
207. Drawer means according to claim 206, wherein said receiving means (203a) comprises groove means (227) into which tooth means (226) engages obtained in said guide means (224).

208. Drawer means according to claim 207, wherein said tooth means (226) and said groove means (227) show a rectangular section.
209. Drawer means according to claim 207, wherein said tooth means (226) and said groove means (227) show a trapezoidal section.
210. Drawer means according to any of the claims 206 to 209, wherein said receiving means (203a) further comprises socket means (228) arranged for receiving screw means functioning as end stroke stop for said receiving means (203a).
211. Drawer means according to any of the claims 195 to 210, wherein said receiving means (203; 203a) is provided with cup means (205) suitable for receiving said container means.
212. Drawer means according to claim 211, wherein said cup means (205) is suitable for being extracted from said receiving means (203; 203a).
213. Drawer means according to claim 211, or 212, wherein said cup means (205) is provided with centring means (231) suitable for being received by form coupling into relative notch means (232) obtained in said receiving means (203; 203a).
214. Drawer means according to any of the claims 211 to 213, wherein said cup means comprises a plurality of cups (205) mutually interchangeable.
215. Drawer means according to claim 214, wherein said cups (205) show external mutually equal dimensions and each of said cups (205) is internally provided with filter holding means (233) suitable for receiving containers of a pre-established size.
216. Drawer means according to any of the claims 211 to 215, wherein said cup means (205) is provided with a lower

portion (234) provided with a distributing opening (235) for said beverages.

217. Drawer means according to claim 216, wherein a distributing nozzle is associated with said lower portion (234).
218. Drawer means according to any of the claims 195 to 217, and further comprising electric switch means (223) suitable for controlling the activation of said apparatus (201).
- 10 219. Drawer means according to claim 218, wherein said receiving means (203; 203a) push-button means (222) is firmly fixed suitable for interacting with said electric switch means (223).
220. Drawer means according to claim 219, wherein said switch means (222) comprises elastically deformable elements (229) arranged for compensating stroke inaccuracies of said receiving means (203; 203a).
- 15 221. Drawer means according to claim 220, wherein said elastically deformable elements (229) comprise flexible lamina means.
- 20 222. Drawer means according to claim 220, wherein said elastically deformable elements (229) comprise helical spring means.
223. Drawer means according to any of the claims 195 to 222, and further comprising pressure blocking means (221) suitable for holding said receiving means (203; 203a) blocked at said operating position (B1).
- 25 224. Drawer means according to claim 223, wherein said receiving means (203; 203a) comprises hook coupling means (220) suitable for engaging with said pressure blocking means (221).
- 30 225. Drawer means according to claim 223, or 224, when depending from any of the claims 218 to 223, wherein said

electric switch means (223) and said pressure blocking means (221) are connected to support means (225).

226. Drawer means according to claim 225, wherein said support means are suitable for being fixed to said base body (204).

5 227. Cup means (205) suitable for being associated with receiving means (203; 203a) of an apparatus for preparing beverages and suitable for receiving container means of a base substance of the beverage to be prepared, characterised in that it is suitable for being extracted from said receiving means (203; 203a).

10 228. Cup means according to claim 227, and further comprising centring means (231) suitable for being received by form coupling into relative notch means (232) obtained in said receiving means (203; 203a).

15 229. Cup means according to claim 227, or 228, and further comprising a plurality of cups (205) mutually interchangeable.

20 230. Cup means according to claim 229, wherein said cups (205) show external dimensions mutually equal and each of said cups (205) is internally provided with filter holding means (233) suitable for receiving containers of pre-established size.

25 231. Cup means according to any of the claims 227 to 230, and further comprising a lower portion (234) provided with a distributing opening (235) for said beverages.

232. Cup means according to claim 231, wherein a distributing nozzle is associated with said lower portion (234).

30 233. Drawer means suitable for being associated with an apparatus for preparing beverages, comprising receiving means (203: 203a) suitable for receiving container means of a beverage to be prepared and electric switch means (223) suitable for enabling said apparatus to be activated, characterised in that, to said receiving means

(203; 203a) deformable push-button means (222) is firmly fixed suitable for interacting with said electric switch means (23) in order to control said electric switch means (23).

- 5 234. Drawer means according to claim 233, wherein said push-button means (227) comprises elastically deformable elements (229) arranged for compensating stroke inaccuracies of said receiving means (203; 203a).
- 10 235. Drawer means according to claim 234, wherein said elastically deformable elements (229) comprise flexible lamina means.
236. Drawer means according to claim 234, wherein said elastically deformable elements (229) comprise helical spring means.
- 15 237. Drawer means according to any of the claims 233 to 236, and further comprising pressure blocking means (221) suitable for blocking said receiving means (203; 203a).
238. Drawer means according to claim 237, wherein said receiving means (203; 203a) comprises hook coupling means
- 20 20) suitable for engaging with said pressure blocking means (221).
239. Drawer means according to claim 237, or 238, wherein said electric switch means (223) and said pressure blocking means (221) are connected to support means (225).
- 25 240. Drawer means according to claim 239, wherein said support means is suitable for being fixed to a base body (204) of said apparatus (201).
241. Drawer means according to claim 240, wherein said receiving means (203; 203a) is moving between a loading position (A1) wherein said receiving means (203; 203a) is arranged externally to said base body (204) in order to receive said container means and an operating position (B1) wherein said receiving means (203; 203a) is arranged internally to said base body (204) in order to bring said

container means to interact with liquid distributing means..

242. Drawer means according to claim 241, wherein said receiving means (203; 203a) is fixed in removable manner to said base body (204).  
5
243. Drawer means according to claim 242, wherein said receiving means (203) is associated with said base body (204) by means of hinge means (217).
244. Drawer means according to claim 243, wherein said hinge means (217) comprises first pin means (218) and second pin means (219) housed in respective seat means (216).  
10
245. Drawer means according to claim 244, wherein said first pin means (218) and said second pin means (219) are associated with said receiving means (203).
- 15 246. Drawer means according to claim 244, or 245, wherein said first pin means (218) and said second pin means (219) extend at opposing sides of said receiving means (203) in order to engage respectively from the bottom and from above said respective seat means (216).
- 20 247. Drawer means according to any of the claims 244 to 246, wherein said first pin means (218) and said second pin means (219) are suitable for being extracted from said seat means (216).
248. Drawer means according to any of the claims 244 to 247, wherein said first pin means (218) and said second pin means (219) are arranged at a distance such that the receiving means (203) may be disengaged from said base body (204) by raising said receiving means (203) along the longitudinal axis of said first pin means (218) and said second pin means (219) and rotating said receiving means (203) towards the exterior.  
25
- 30 249. Drawer means according to any of the claims 243 to 248, wherein said hinge means (217) is connected to said base body (204) by means of connecting means (211a, 211b).

250. Drawer means according to claim 249, wherein said connecting means (211a, 211b) comprises first half-shell means (212) and second half-shell means (213) mutually fixed by a screw (214).
- 5 251. Drawer means according to claim 249, or 250, when depending from any of the claims 76 to 80, wherein said connecting means (211a, 211b) identifies said seat means (216).
252. Drawer means according to any of the claims 249 to 251, wherein said connecting means (211a, 211b) is suitable for being height positioned on post means (210) of said base body (204).
- 10 253. Drawer means according to claim 252, wherein said receiving means (203a) is sliding along guide means (224) associated with said base body (204).
- 15 254. Drawer means according to claim 253, wherein said receiving means (203a) comprises groove means (227) wherein tooth means (226) engages obtained in said guide means (224).
- 20 255. Drawer means according to claim 254, wherein said tooth means (226) and said groove means (227) show a rectangular section.
256. Drawer means according to claim 254, wherein said tooth means (226) and said groove means (227) show a trapezoidal section.
- 25 257. Drawer means according to any of the claims 253 to 256, wherein said receiving means (203a) further comprises groove means (228) arranged for receiving screw means functioning as end stroke stop for said receiving means (203a).
- 30 258. Drawer means according to any of the claims 233 to 257, wherein said receiving means (203; 203a) is provided with cup means (205) suitable for receiving said container means.

259. Drawer means according to claim 258, wherein said cup means (205) is suitable for being extracted from said receiving means (203; 203a).
260. Drawer means according to claim 258, or 259, wherein said cup means (205) is provided with centring means (231) suitable for being received by form coupling into relative notch means (232) obtained in said receiving means (203; 203a).
261. Drawer means according to any of the claims 258 to 260, wherein said cup means comprises a plurality of cups (205) mutually interchangeable.
262. Drawer means according to claim 261, wherein said cups (205) show external dimensions mutually equal and each of said cups is internally provided with filter holding means (233) suitable for receiving containers of a pre-established size.
263. Drawer means according to any of the claims 260 to 262, wherein said cup means (205) is provided with a lower portion (234) provided with a distributing opening (235) for said beverages.
264. Drawer means according to claim 263, wherein a distributing nozzle is associated with said lower portion (234).

Fig. 2a

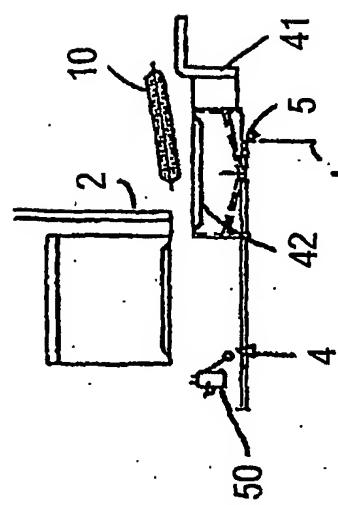


Fig. 2b

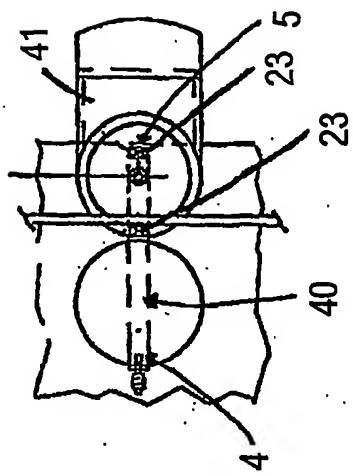
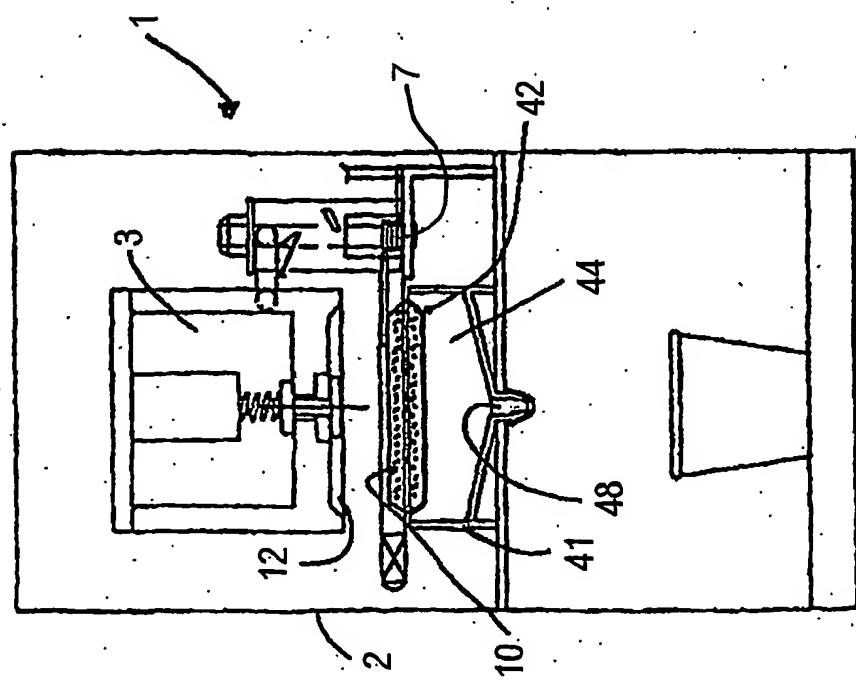


Fig. 1



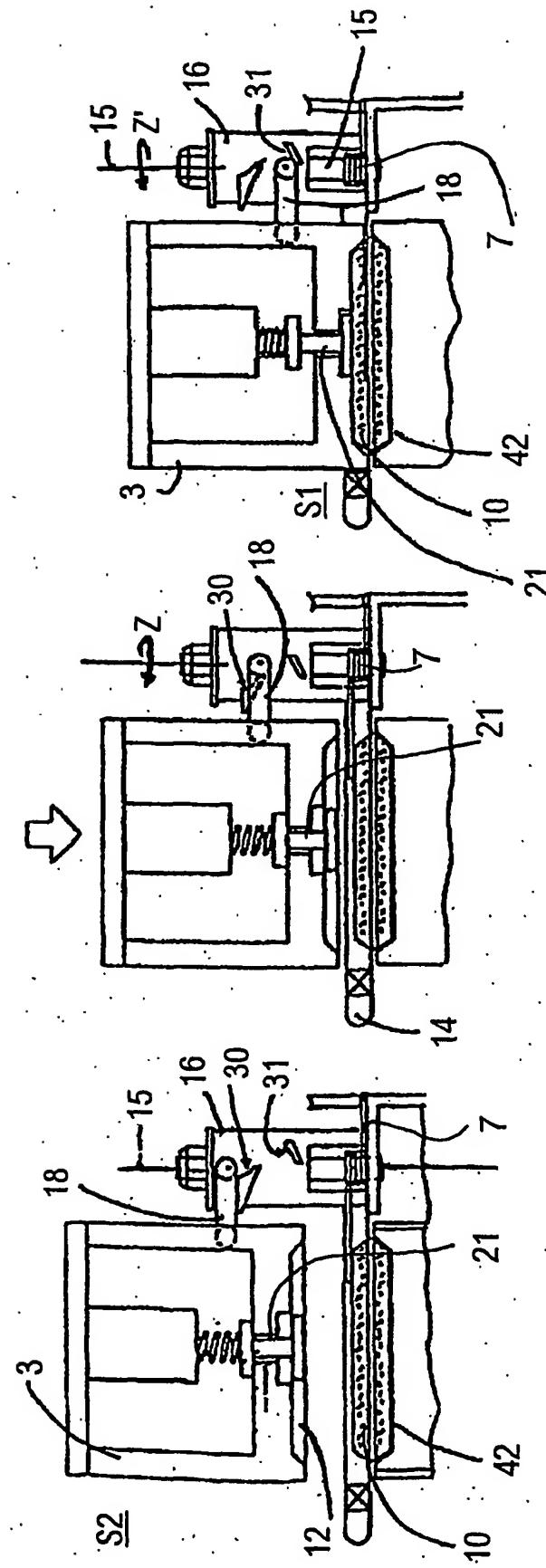


Fig. 3a

Fig. 3b

Fig. 3c

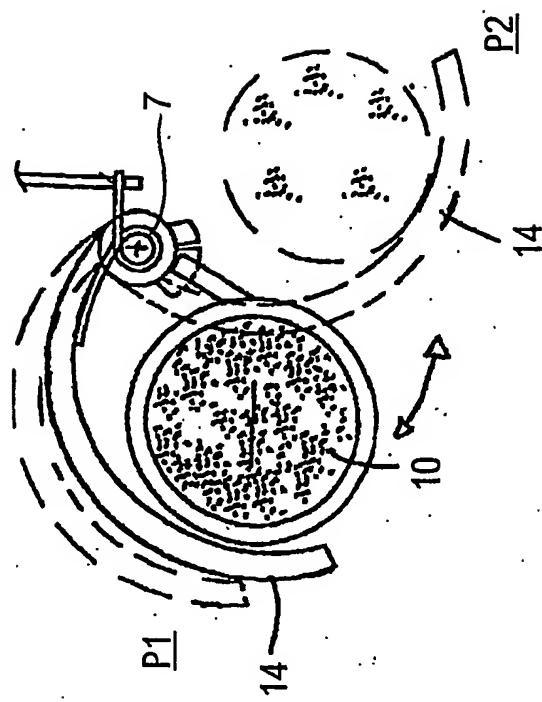


Fig. 4

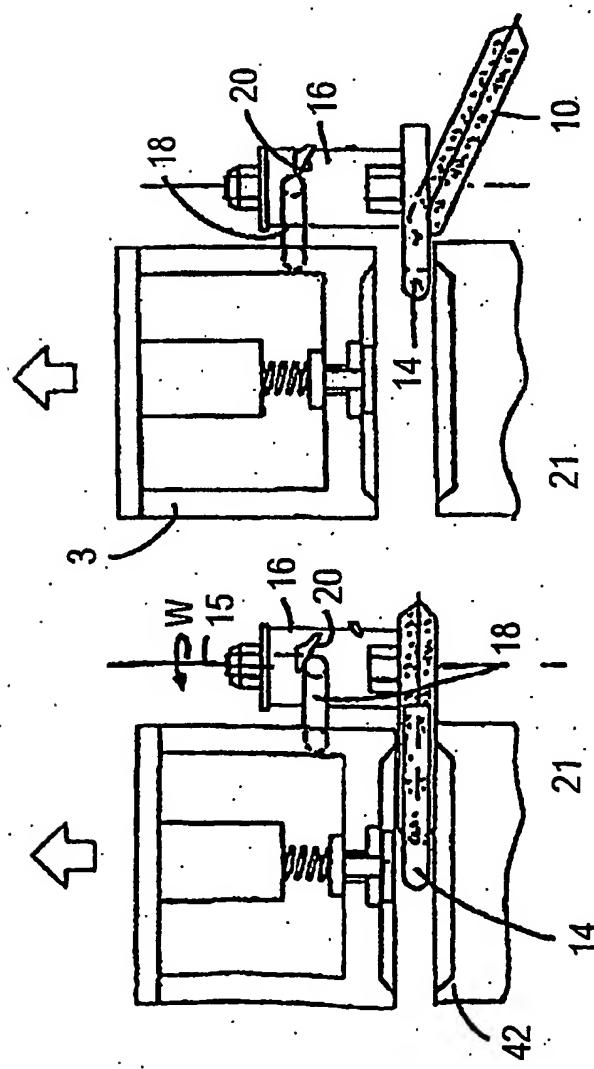


Fig. 3e

Fig. 3d

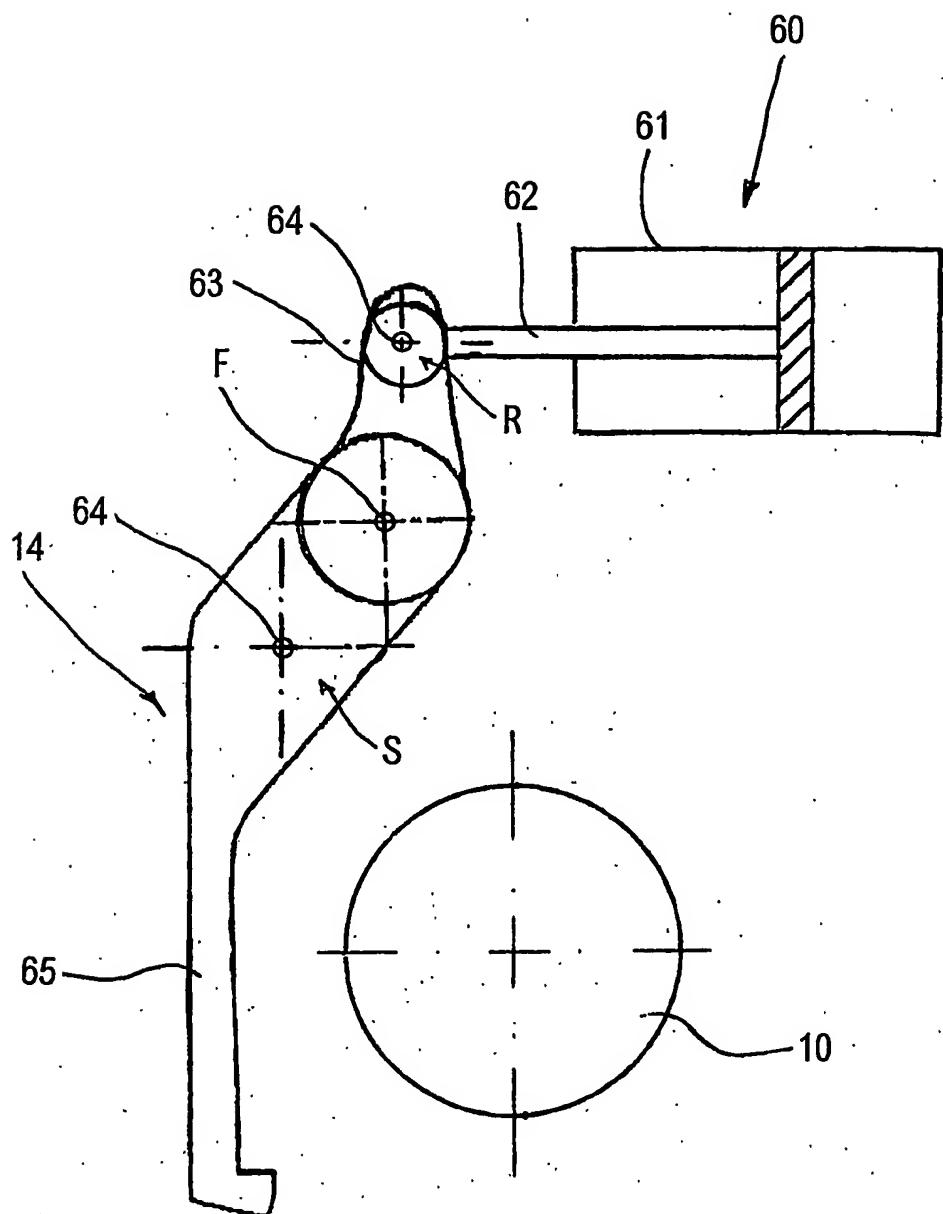


Fig. 5

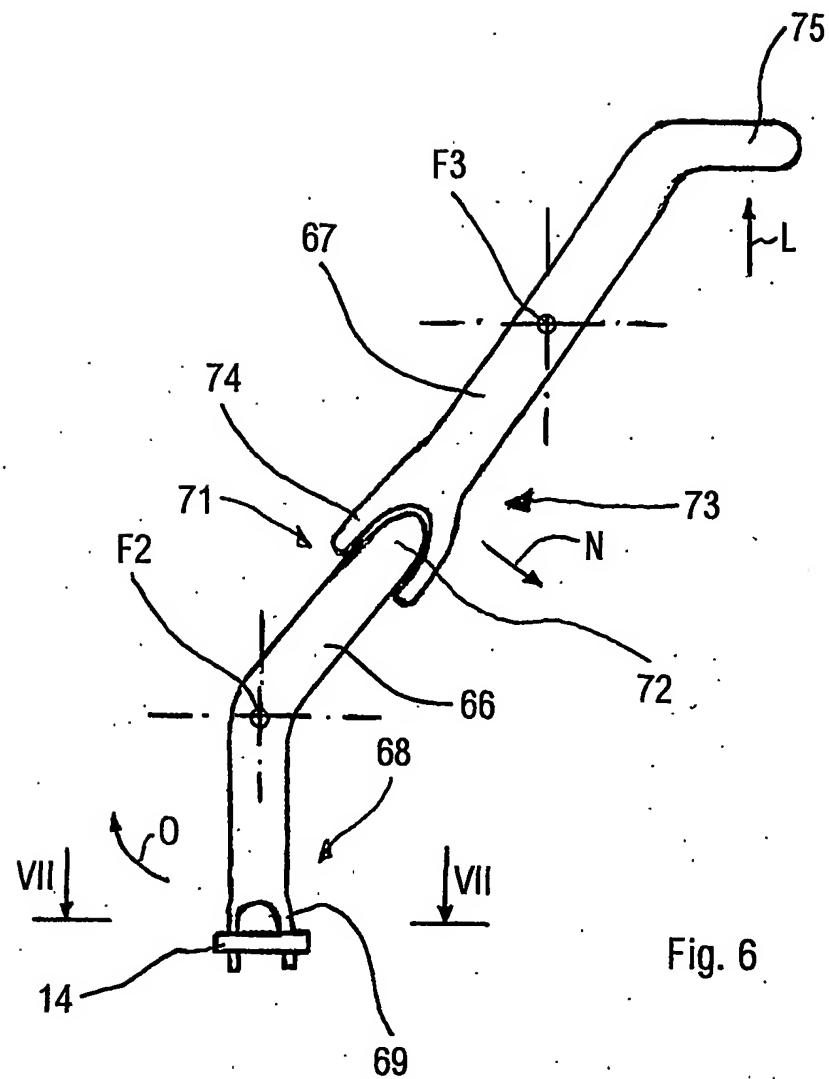


Fig. 6

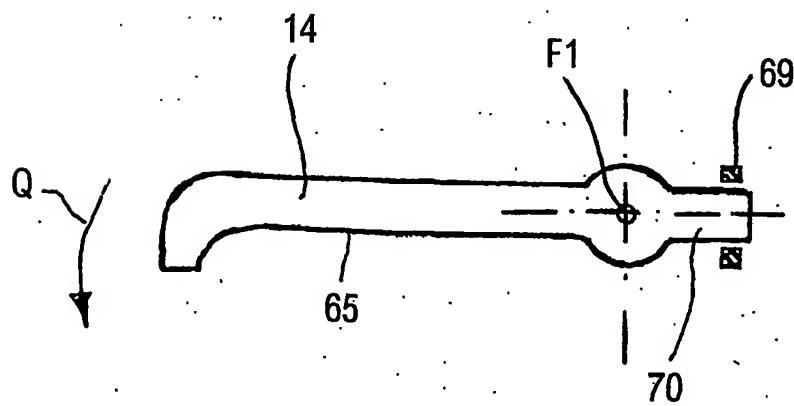


Fig. 7

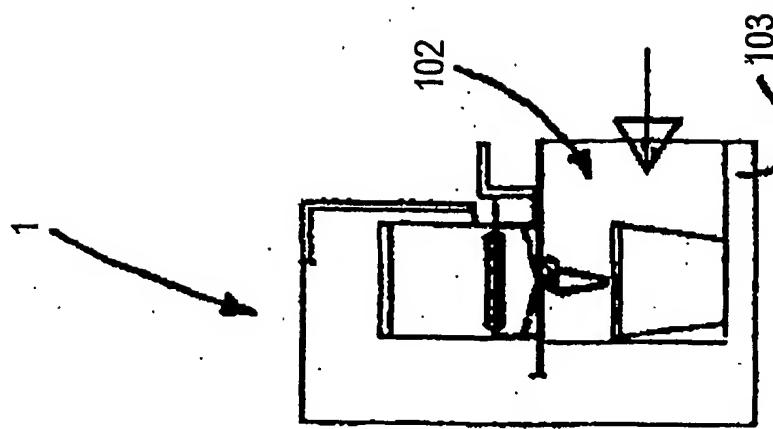


Fig. 8

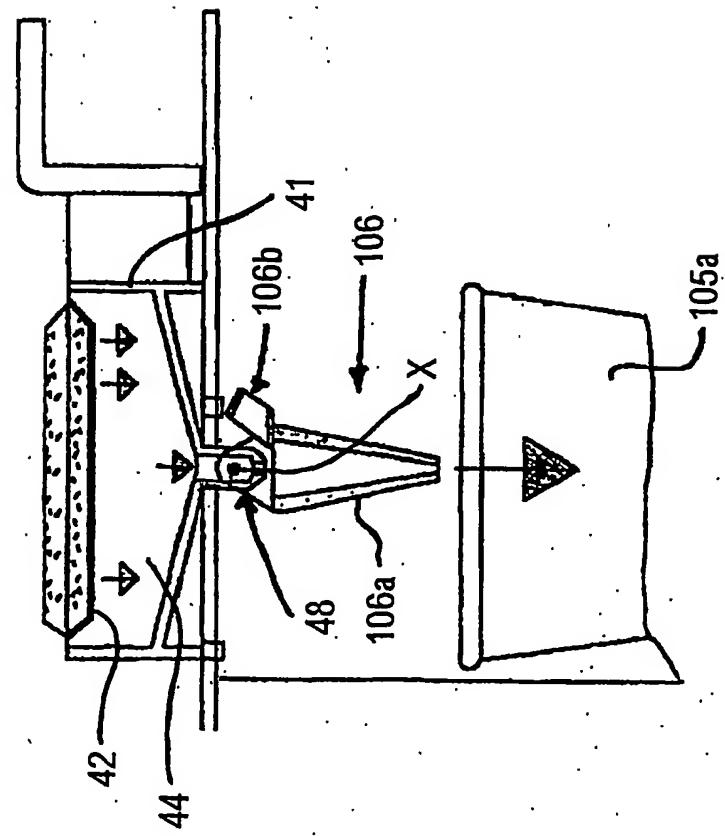


Fig. 9

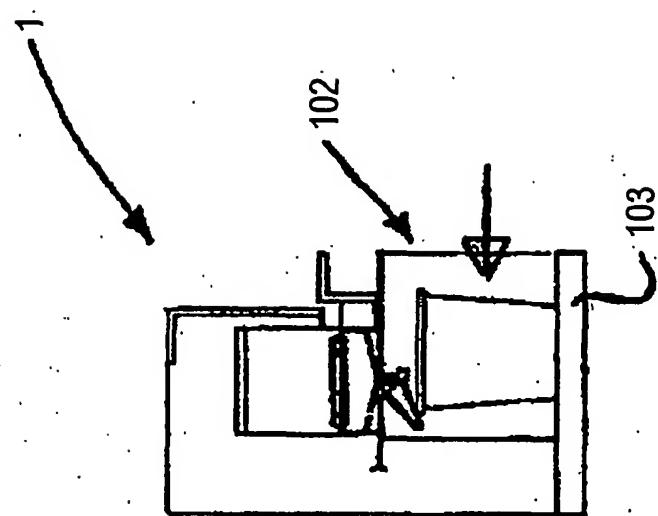


Fig. 10

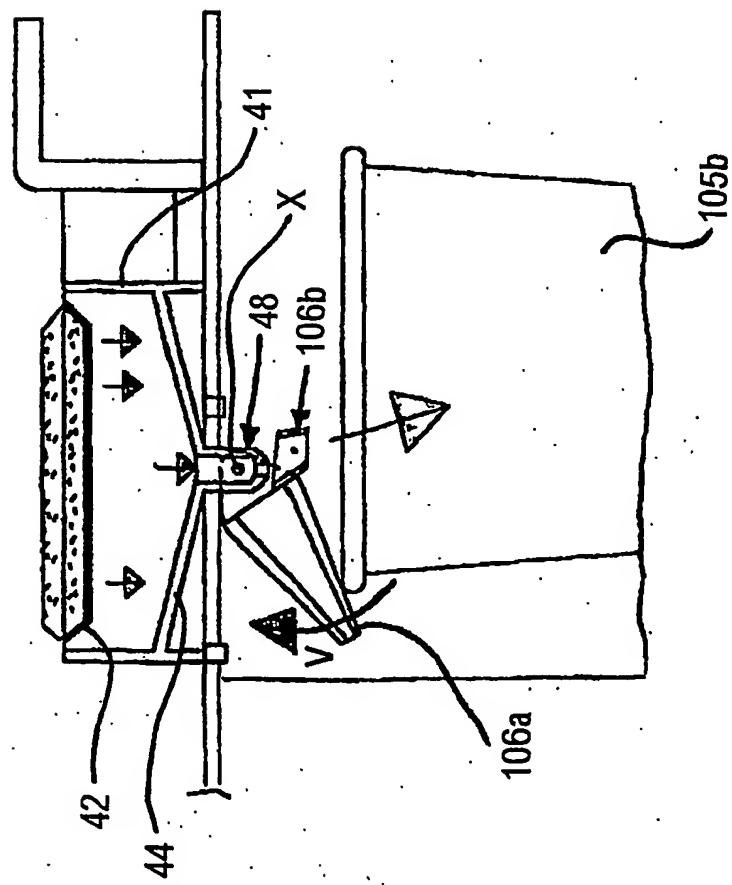
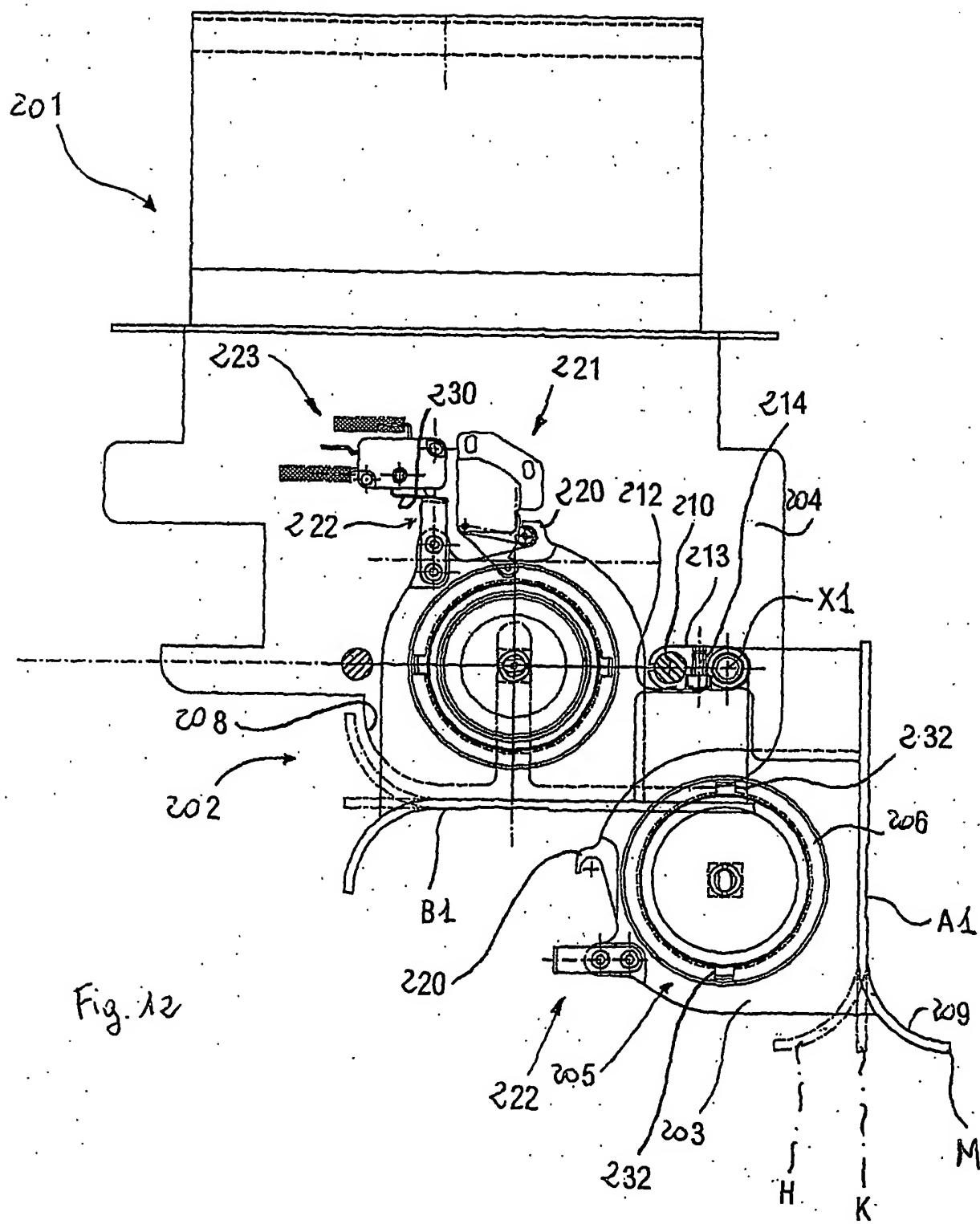


Fig. 11



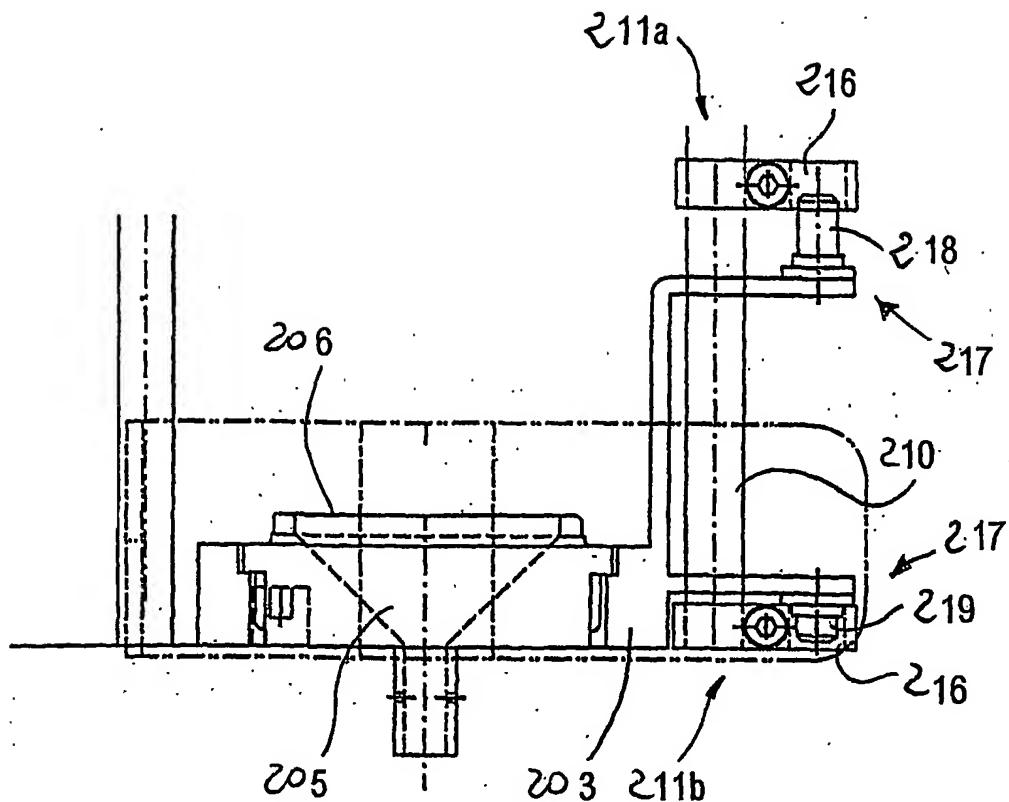


Fig. 13

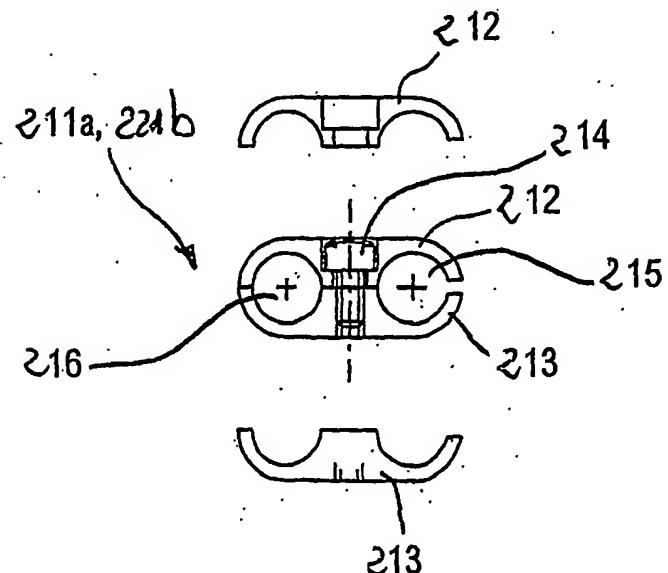


Fig. 23

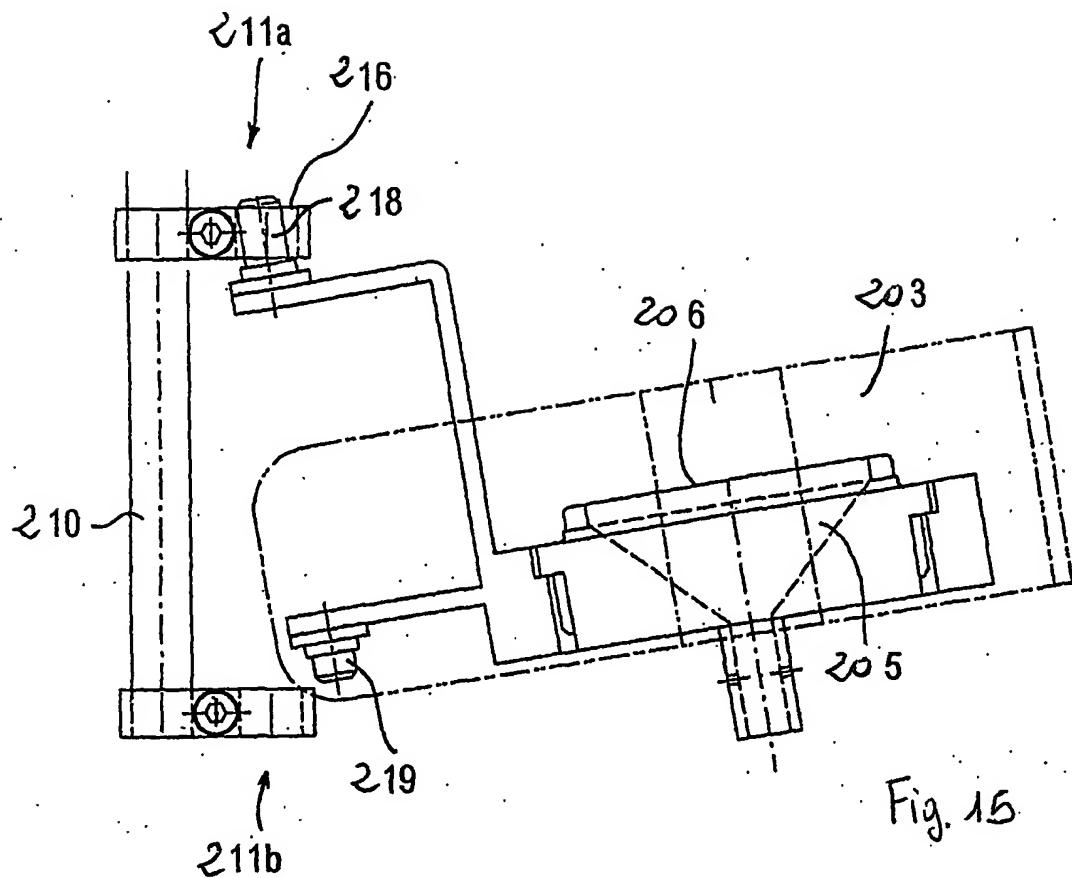


Fig. 15

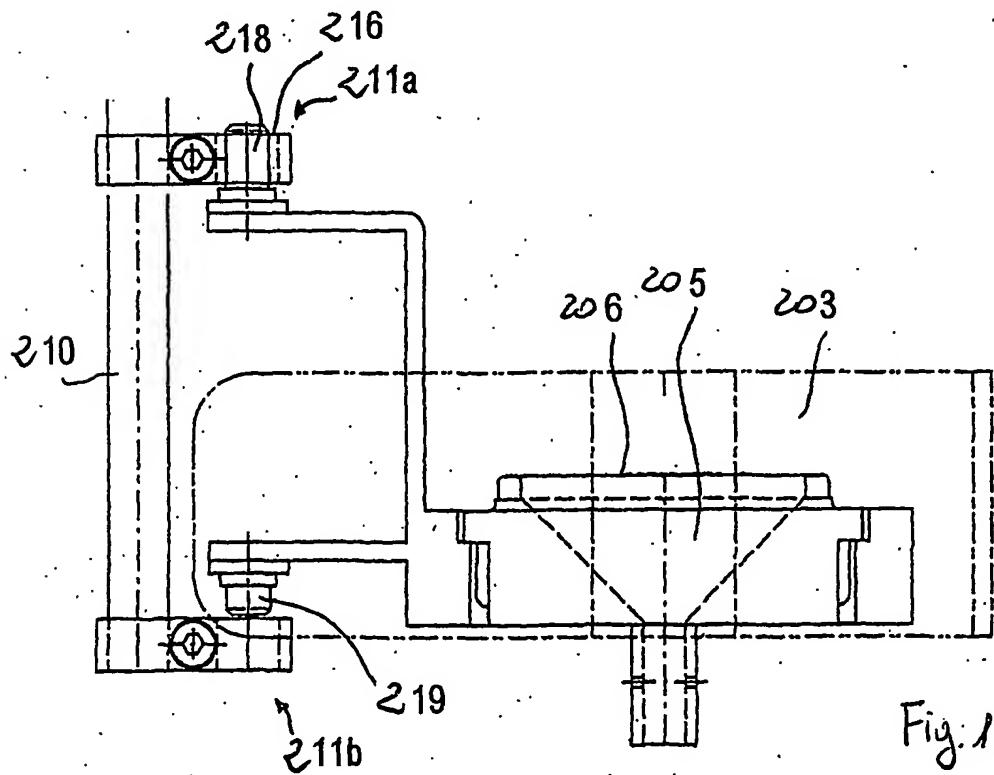
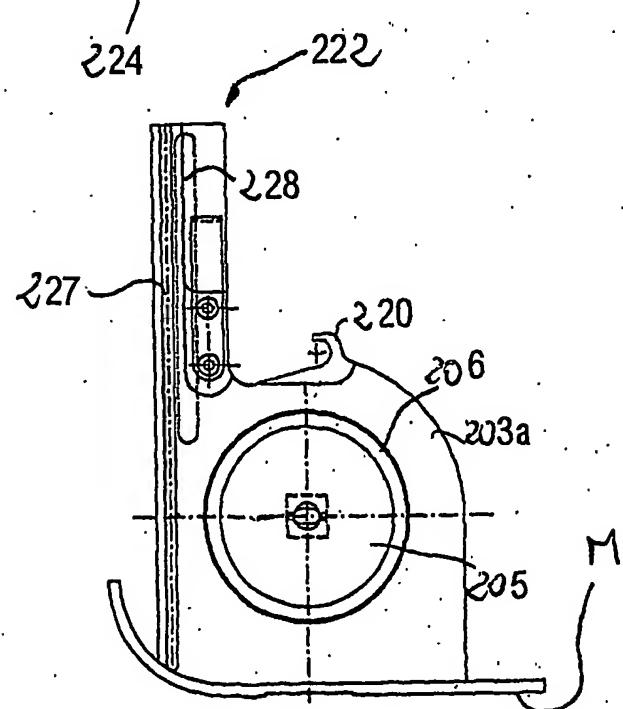
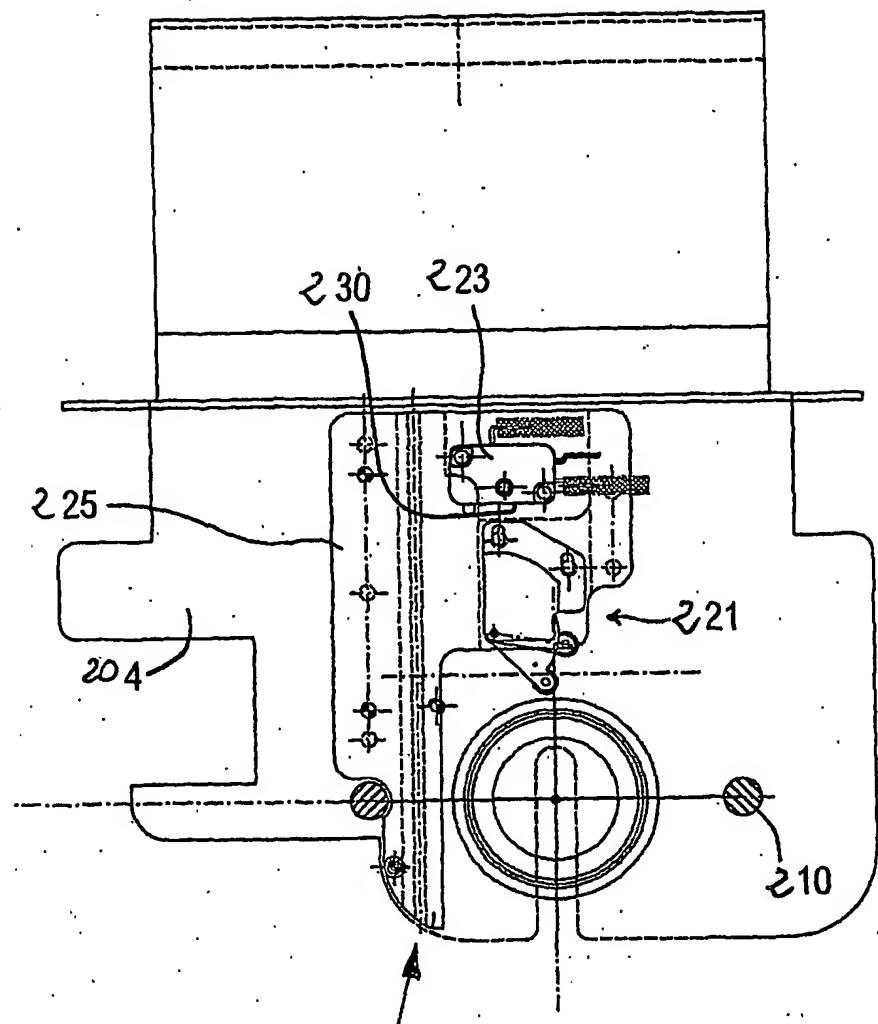


Fig. 16



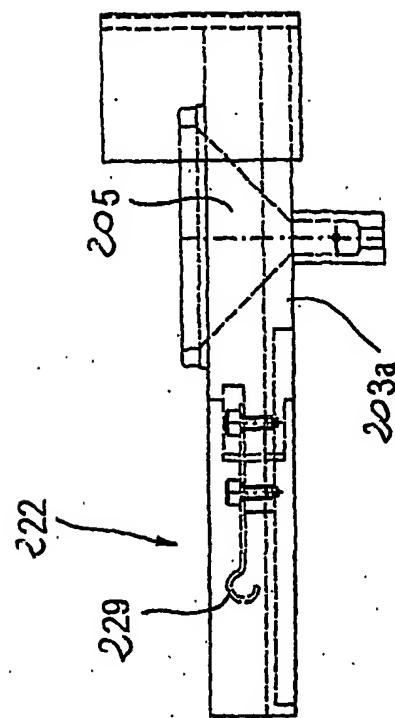


Fig. 19

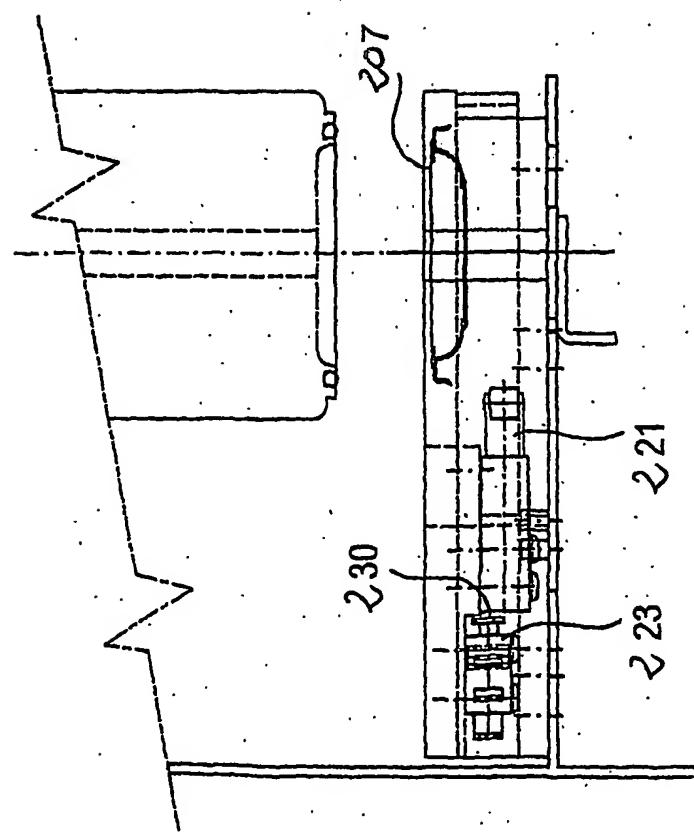


Fig. 18

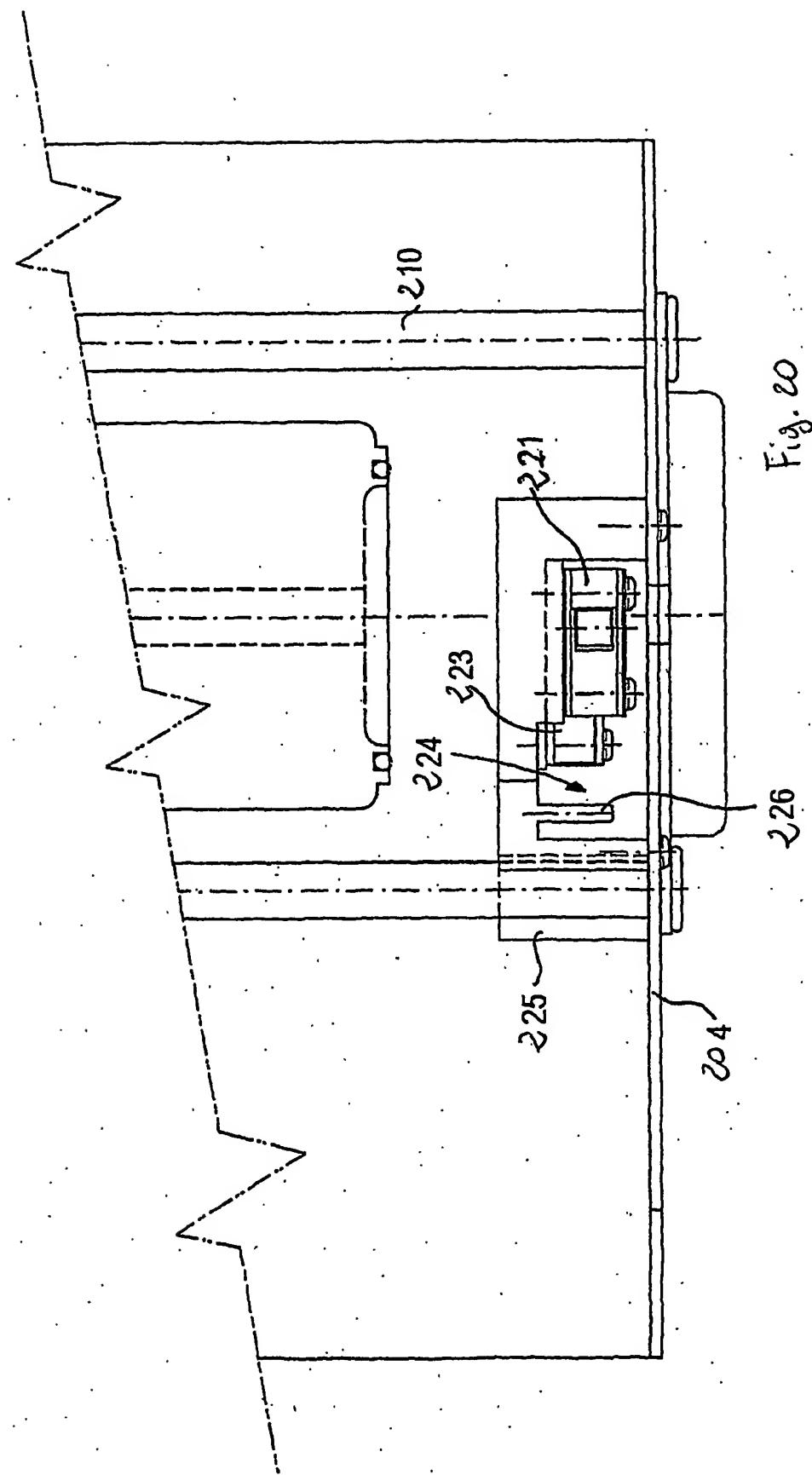


Fig. 20

26

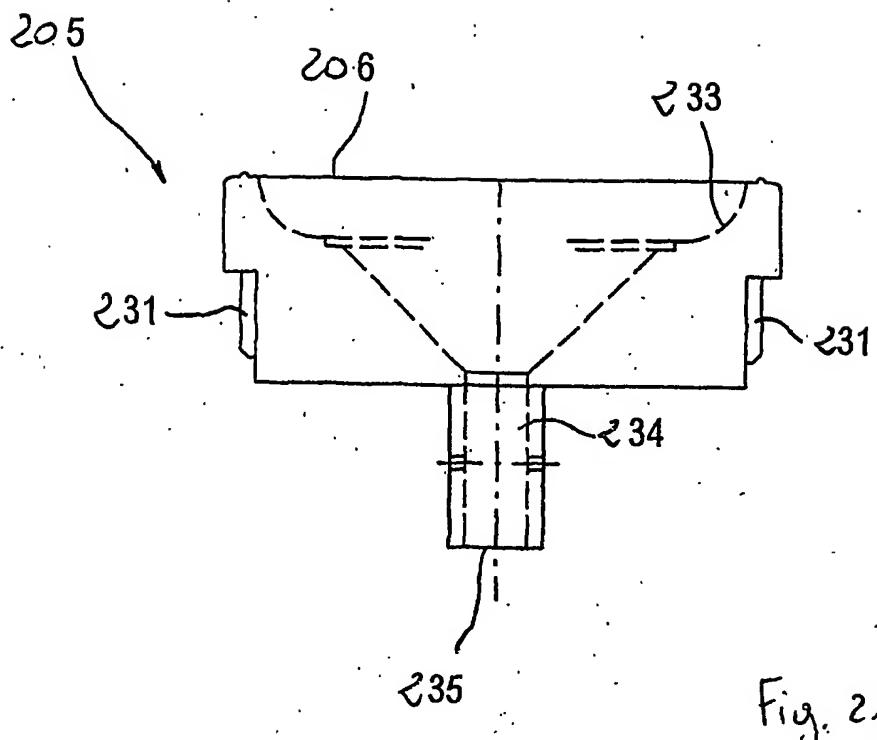


Fig. 21

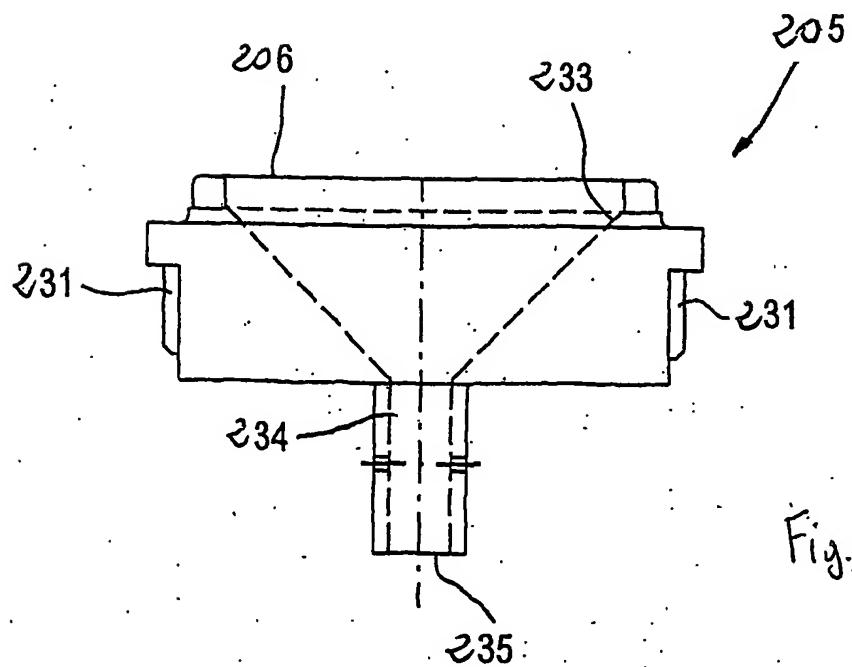
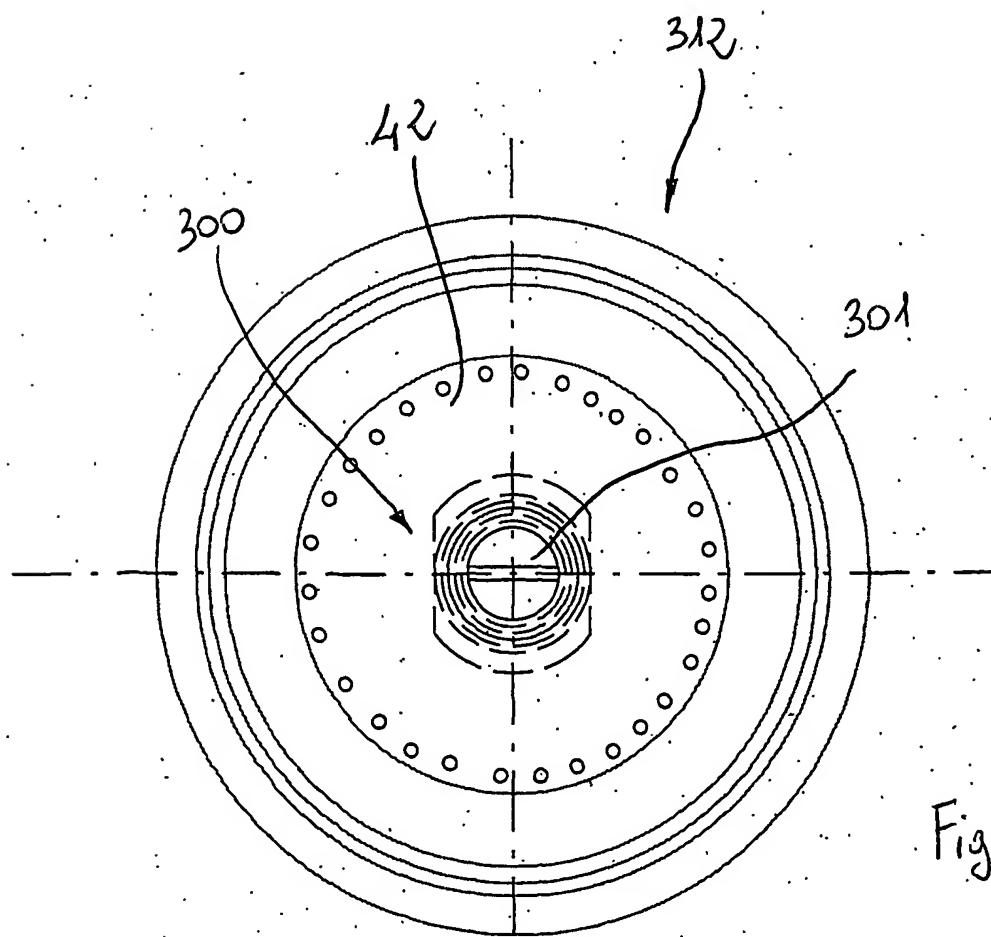
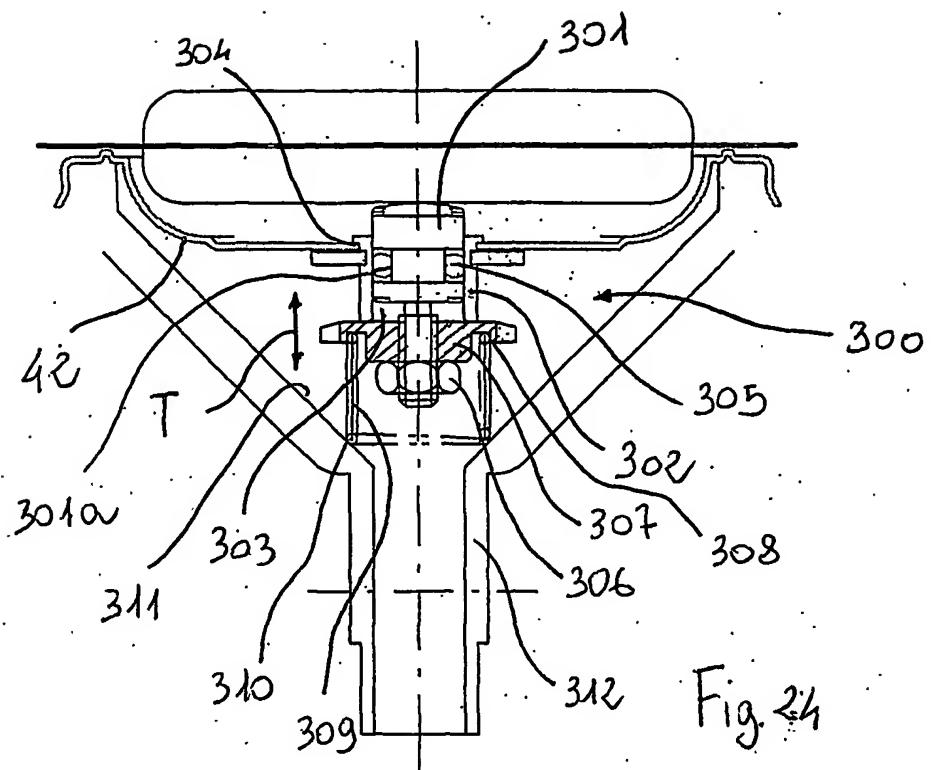


Fig. 22



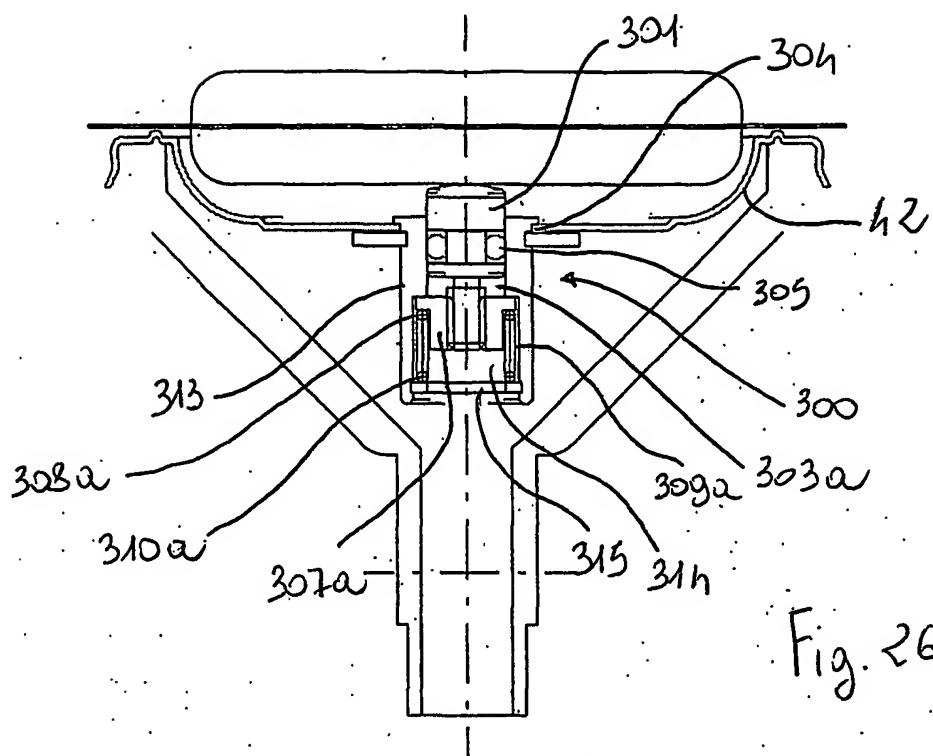


Fig. 26

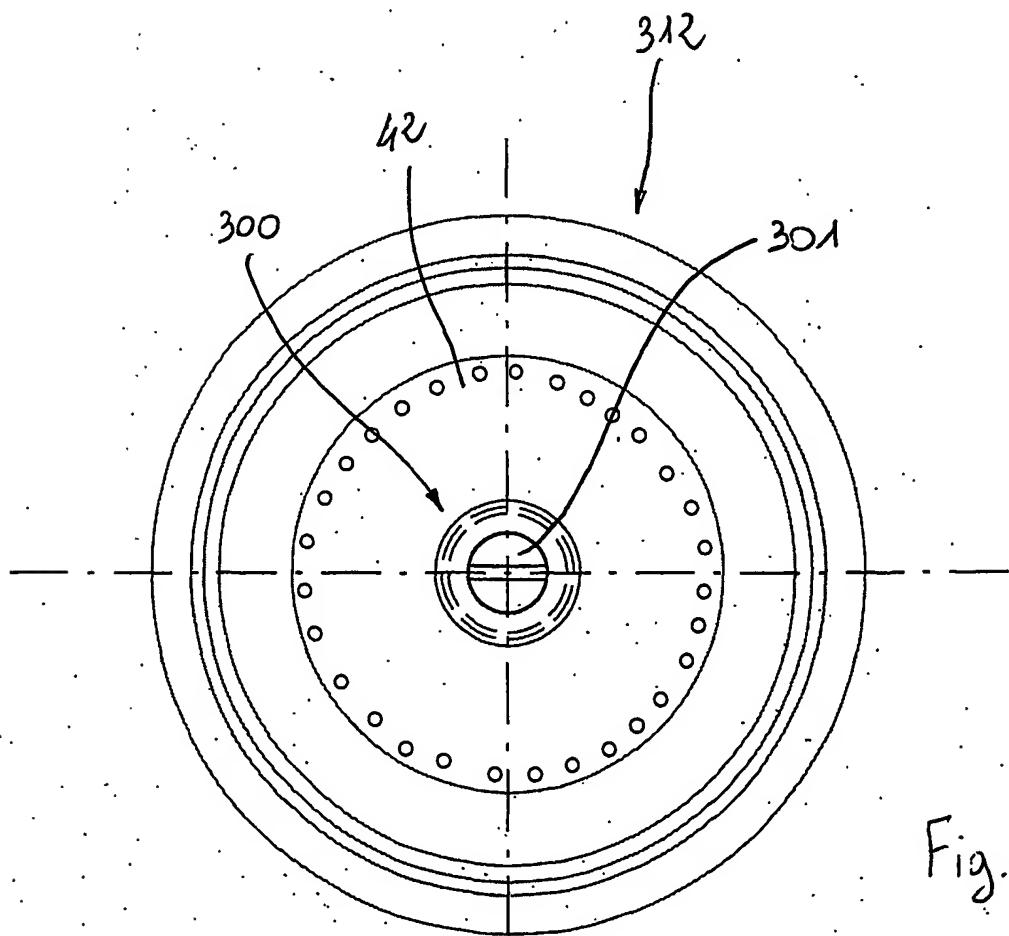
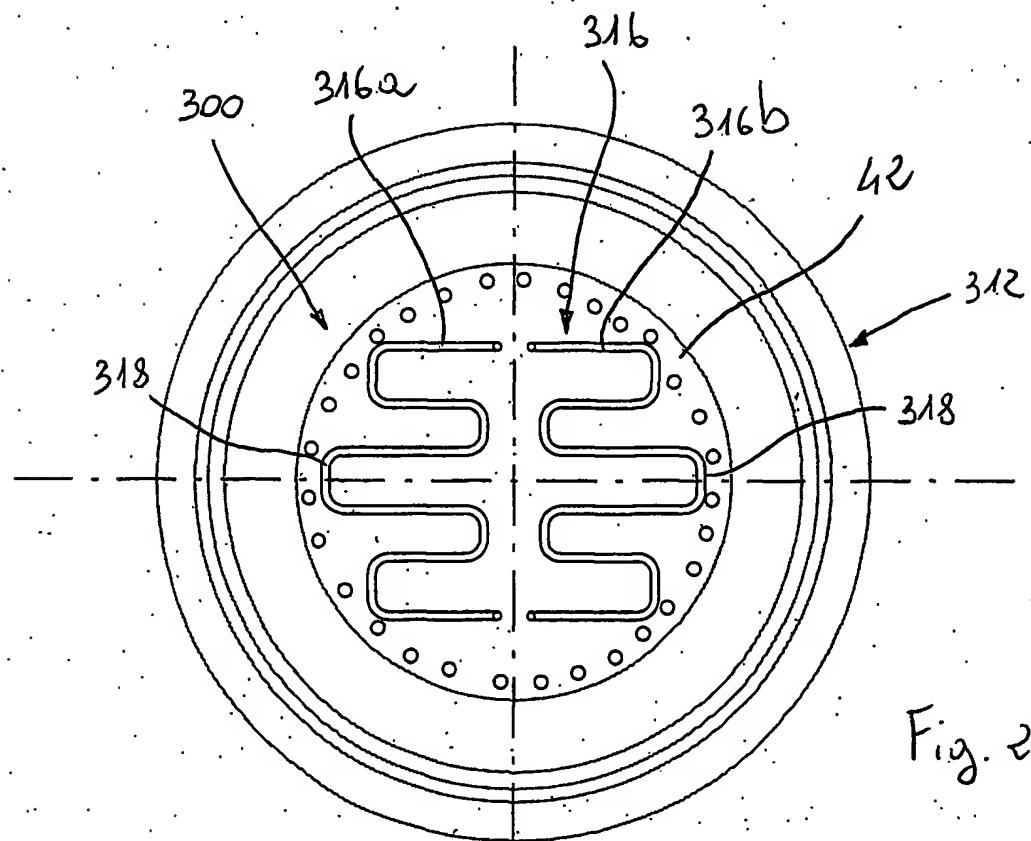
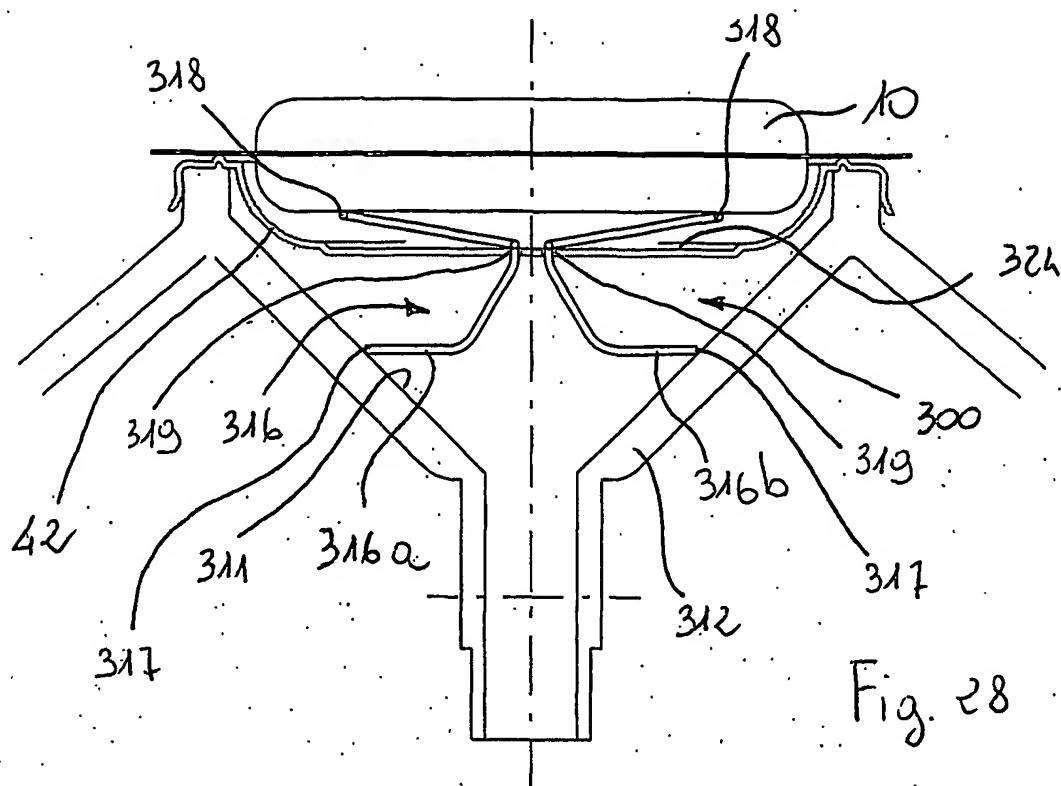


Fig. 27



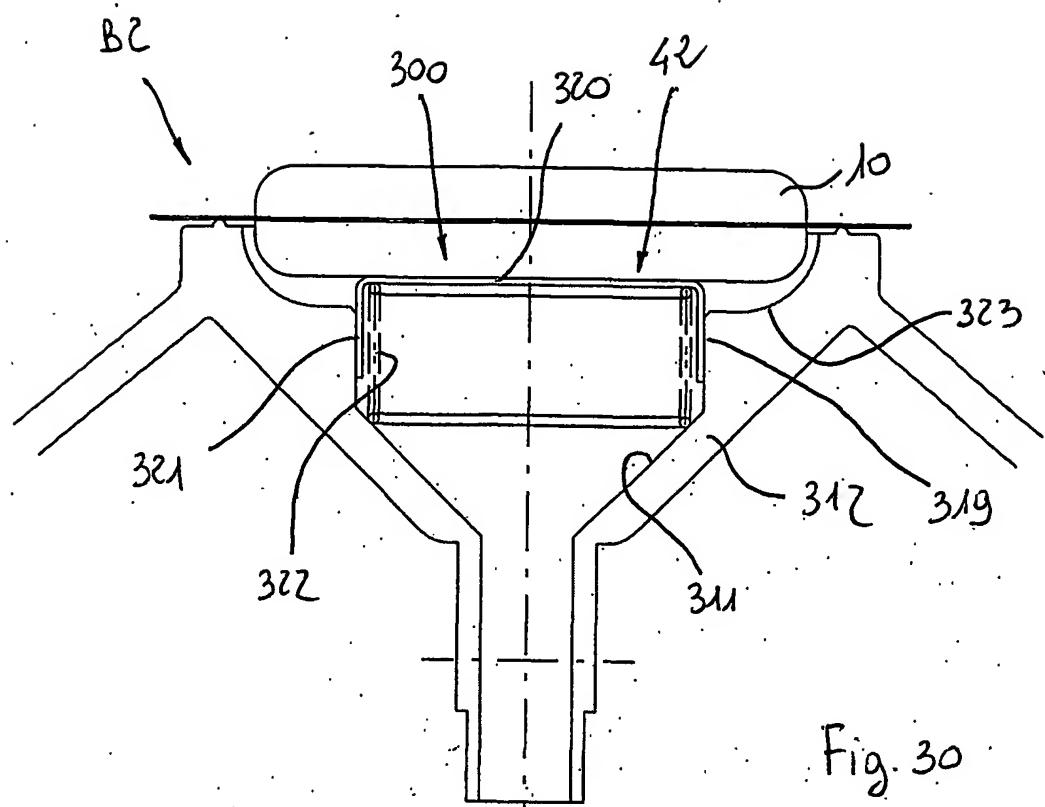


Fig. 30

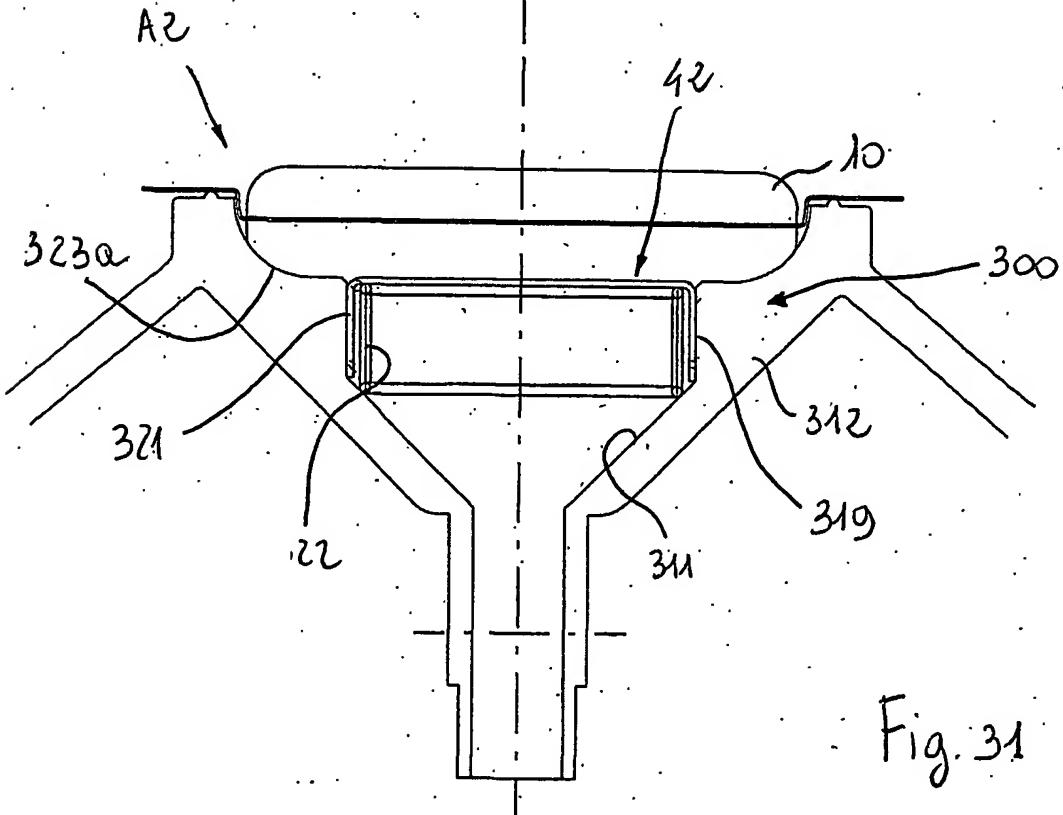


Fig. 31

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 A47J31/40 A47J31/06

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	EP 1 050 258 A (EUROMATIC S.R.L.) 8 November 2000 (2000-11-08) column 2, line 31 -column 4, line 26; figures 1,2 & IT B0990215 A 6 November 2000 (2000-11-06) ---	1,21,23
P,A	column 2, line 31 -column 4, line 26; figures 1,2 & IT B0990215 A 6 November 2000 (2000-11-06) ---	3-9
A	US 5 406 882 A (SHAANAN GAD) 18 April 1995 (1995-04-18) column 4, line 39 -column 5, line 46; figures 1-3 ---	1,3-12
A	US 5 479 848 A (VERSINI ROLLAND) 2 January 1996 (1996-01-02) column 3, line 15 -column 4, line 24; figures 5,6 ---	1,3,6-10

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the International search

27 March 2002

Date of mailing of the International search report

15/04/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Novelli, B

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

Continuation of Box I.2

Claims Nos.: 52-264

In view of the large number and also the wording of the claims presently on file, which render it difficult, if not impossible, to determine the matter for which protection is sought, the present application fails to comply with the clarity and conciseness requirements of PCT Article 6 (see also PCT Rule 6.1(a)) to such an extent that a meaningful search on the basis of the claims is impossible.

Consequently, the search has been carried out for those parts of the application which do appear to be clear 'and concise!', namely claims 1-51.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as IPEA is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 1050258	A	08-11-2000	IT EP US	B0990215 A1 1050258 A1 6345570 B1	06-11-2000 08-11-2000 12-02-2002
US 5406882	A	18-04-1995	AT AU AU CA WO DE DE DK EP	169195 T 680752 B2 2064695 A 2126800 A1 9526669 A1 69503888 D1 69503888 T2 752824 T3 0752824 A1	15-08-1998 07-08-1997 23-10-1995 01-10-1995 12-10-1995 10-09-1998 22-04-1999 10-05-1999 15-01-1997
US 5479848	A	02-01-1996	FR AT AU DE DE EP ES WO	2689383 A1 149303 T 3956193 A 69308547 D1 69308547 T2 0634904 A1 2101310 T3 9319655 A1	08-10-1993 15-03-1997 08-11-1993 10-04-1997 02-10-1997 25-01-1995 01-07-1997 14-10-1993

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**